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FINAL
ENVIRONMENTAL STATEMENT
for the
JIM BRIDGER THERMAL-ELECTRIC

UNITED STATES
DEPARTMENT OF THE INTERIOR

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FINAL
ENVIRONMENTAL STATEMENT
for the
JIM BRIDGER THERMAL-ELECTRIC
GENERATION PROJECT

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Submitted April 28, 1972

Daniel P. Baker
State Director, Wyoming

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SUMMARY

ENVIRONMENTAL IMPACT STATEMENT
( ) DRAFT (X)FINAL

Prepared by: U. S. Department of the Interior, Bureau of Land Management, Wyoming State Office

1. Jim Bridger Thermal-Electric Complex

   (X)Administrative Action ( )Legislative Action

2. The production portion of the complex, including a 1500 MW coal-fired steam electric plant, a strip mine nearby, a 42-mile long water delivery system, and rail and highway access, is situated in central Sweetwater County in southwest Wyoming. The distribution system includes three 345 kv transmission lines connecting the plant with substations in Bingham and Bannock Counties in eastern Idaho, about 235 miles to the west. The plant is presently under construction on private lands northeast of Rock Springs, Wyoming. The first 500 MW unit is expected to go on line in March, 1974; the second in June of 1975, and the third in 1976 or later.

   In Wyoming, more than half of the land involved in the project is administered by the Bureau of Land Management. Federal grants or use permits in the form of rights-of-way are necessary before powerline construction can proceed. Pursuant to Section 102(2)(c) of the National Environmental Policy Act, this report is submitted prior to issuing any further rights-of-way for this project. (One right-of-way for a 7-mile spur line railroad has been issued by the Bureau of Land Management after an analysis indicated there were no significant environmental impacts involved.)

3. Environmental impacts identified for the complex include: (a) effects of stack emissions on air quality and rangeland ecosystem, (b) erosion caused by disturbing native vegetation in construction, (c) disturbance of wildlife by increased traffic and furnishing access to remote areas along powerline route, and (d) the impact of the construction force and the permanent employees on community growth.

4. Alternatives considered involve alternative plant and powerline locations and alternative sources of power.

5. Comments requested from: see Chapter XI, page 2.

6. Date made available to CEQ and the Public:

   Draft Statement: 10-22-71
   Final Statement: JUL 27 1972

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Table of Contents

Page

Title Page i
Summary, Environmental Impact Statement ii
Table of Contents iii

I. Synopsis and Conclusions I-1
- A. Background I-1
- B. Significant Environmental Impacts I-1
- C. Action Program for Environmental Protection I-3

II. Purpose of Proposal and Need for Power II-1

III. Description of Proposal III-1
- A. General III-1
  - 1. Coal-fired power plant (1500 MW in size) III-1
  - 2. Three 345 KV transmission lines III-2
  - 3. Water Pipeline and surge pond III-3
  - 4. Strip mine for coal III-4
- B. Summary of Statistics of Jim Bridger Plant III-6
- C. Interrelationship between Jim Bridger and other Projects or Proposals III-8

IV. Description of the Environment IV-1
- A. Existing Air Quality IV-1
- B. Existing Water Quality - Green River Basin IV-2
- C. Geology IV-4
- D. Soils IV-7
- E. Existing Ecology (Flora and Fauna) IV-9
  - 1. Desert Shrub complex IV-9
  - 2. Montane Forest-Mountain Shrub complex IV-11
- F. Settlement Patterns IV-14
- G. Economy and Cultural Patterns IV-15
- H. Cultural Values IV-17
  - 1. Unique Communities - Rare Species IV-17
  - 2. Wild and Scenic Rivers IV-17
- I. Red Desert Management Study IV-18
- J. Future Trends IV-19

V. Summary of Environmental Impacts V-1
- A. Generating Plant and Related Facilities V-3
  - 1. Stack Emissions V-3
    - a. Jim Bridger Plant Emissions V-3
    - b. Relationship between Emissions and Standards V-5
    - c. Effects of Emissions V-10
    - d. Trace Elements V-16
    - e. Emission Control and Guarantees V-19
    - f. Company Plans to Maintain Air Quality V-20
  - 2. Generating Plant Impacts Other than Emissions V-24
    - a. Construction Materials V-24
    - b. Water Quality V-24

Page

V. Summary of Environmental Impacts, cont'd.
    2. c. Atmosphere V-27
        d. Land Use V-27
        e. Scenic Views, Vistas and Wilderness V-36
        f. Flora and Fauna V-37
        g. Archeological and Historic Values V-37
  B. Transmission Lines V-39
    1. Soil Erosion and Deposition V-39
    2. Flora and Fauna V-40
    3. Land Use V-41
    4. Aesthetics V-43
    5. Cultural Factors V-44
    6. Inductive Coupling V-44
    7. Ozone V-45
  C. Water Supply System V-46
    1. Water Quality and Quantity V-46
    2. Soil and Erosion Deposition V-47
    3. Flora and Fauna V-47
    4. Scenic Views and Wilderness - Open Space Qualities V-48
    5. Other V-49
  D. Coal Mine Operation V-50
    1. Soil Erosion and Deposition V-50
    2. Water V-50
    3. Atmosphere V-50
    4. Flora and Fauna V-51
    5. Scenic Views V-51
    6. Other V-51
  E. Cumulative Impacts V-53
  F. Accidents and Catastrophes V-55
  G. Unknown and Partially Understood Impacts V-57
  H. Economic Impacts V-58

VI. Measures Taken to Enhance, Protect or Mitigate Impacts VI-1
  A. Transmission Line Locations VI-1
  B. Water Pipeline and Surge Pond Location VI-5
  C. Revegetation of Spoil Piles and other Disturbed Areas VI-6
  D. Plant Site Operation, Disposal and Monitoring Systems VI-10
  E. Stipulations VI-15

VII. Adverse Impacts which cannot be Avoided VII-1

VIII. Short-Term Use vs Long-Term Productivity VIII-1

IX. Irreversible and Irretrievable Commitment of Resources IX-1

X. Alternatives to the Proposal X-1
  A. Other Sources of Electric Power X-1
    1. Delay or Nonconstruction Alternative X-1
    2. Hydroelectric alternative (after 1976) X-2
    3. Nuclear alternative (after 1976) X-3
    4. Geothermal alternative (after 1976) X-3
    5. Oil and gas alternative X-4

Page

X. Alternatives to the Proposal, cont'd.
- B. Alternative Generating Plant Locations X-6
  - 1. Idaho location X-6
  - 2. Green River location X-6
  - 3. Other locations X-7
- C. Alternative Regional Locations for Transmission Lines X-8
  - 1. Alternative transmission line voltage X-9
  - 2. Alternative transmission line routing X-11
    - a. Relationship of existing lines X-11
    - b. Split corridors X-13
    - c. Reference to mineral resources X-14

XI. Consultation and Coordination XI-1
- A. Consultation Prior to draft Statement XI-1
- B. Distribution of Draft Statement XI-4
- C. Summary of Comments XI-8
- D. Comments Received from Respondents XI-27

CHAPTER ONE

SYNOPSIS AND CONCLUSIONS

I. SYNOPSIS AND CONCLUSIONS

This is an overview of important environmental impacts and a proposed action program for environmental protection that resulted from an intensive review of the Jim Bridger Project.

A. BACKGROUND

This final report results from the formal process required to comply with the NATIONAL ENVIRONMENTAL POLICY ACT OF 1969. The draft environmental statement was prepared by a multi-discipline team of BLM employees from Wyoming, Idaho, Oregon, and Washington, D. C. They used the procedure recommended in U.S. Geological Survey's Bulletin 645 to determine and weigh impacts. Some 200 copies of the draft were sent to: concerned agencies at the Federal, local and State levels; environmental organizations; and individuals with special expertise or interests. The comments received were analyzed and pertinent comments and information incorporated into this document by BLM's Wyoming State Office staff. Heavy emphasis was placed herein on answering, where possible, the deficiencies identified in the draft by those who offered comments.

B. SIGNIFICANT ENVIRONMENTAL IMPACTS

The stack emissions caused by burning 750 tons of coal per hour under full operation have by far the most significant impact on the high altitude desert environment. The emissions will comply with applicable Federal and Wyoming air quality standards for particulate matter and should comply for oxides of nitrogen and sulfur except in rare and uncommon situations.

Even though the emissions are generally within the standards, a localized lowering of visibility during certain weather conditions is possible. This will occur if significant quantities of stack gas are converted to particulate matter. No widespread adverse impacts on the salt desert shrub ecosystem is expected although trace elements or other fly ash constituents may affect individual plant species within one to two miles of the generating station.

The companies, Pacific Power and Light Company and Idaho Power Company have tested the efficiency of the air pollution abatement equipment in a pilot precipitator testing program using Jim Bridger coal. Based on these tests and manufacturer's guarantees (backed by contractual performance testing requirements), they have decided not to install sulfur dioxide removal equipment at this time. They are, however, allowing space for such equipment and have designed the equipment so that problems associated with retrofit are not expected.

One of the most questioned statements in the draft concerned the fate of Jim Bridger emissions. No discernible impact on other airsheds over 100 km. away is expected. This finding is based on the Southwest Energy Study findings and the dilution effect offered by distance.

In spite of an intensive effort to select the most environmentally sound routing for the transmission lines, towers and conductors of the size involved will have an adverse visual impact on the natural scene.

Although all of the components of the project offer the potential of increasing erosion with resulting lowering of surface water quality, stipulations in rights-of-way should reduce the impact to an acceptable level. The companies have purchased water rights to roughly 30,000 acre feet of water from the Green River annually. None of this water will leave the plant site to return to the Green River. The net increase in salinity of the Green River caused by withdrawal of the amount purchased is considered too minute to be measured. A minor increase(less than 2 ppm) is predicted for the Colorado River at Lake Mead.

Burying fly ash, bottom ash, and blowdown residues is not expected to contaminate ground water supplies. The geological formations involved do not lend themselves to rapid movement of water, and the arid climate further reduces the potential for percolation from the surface.

The reduction in forage and cover, when coupled with the increase in human activity caused by the complex, will have an adverse impact on wildlife. Reductions in herd sizes are not likely, but some antelope and sage grouse may leave the immediate vicinity of construction activity. The impacts on rodents and other small animals driven from the disturbed area will be more severe assuming their ecologic niche to be more fully occupied than is the case with big game.

Several respondents to the draft statement question whether reclamation of the spoil piles following strip mining is possible. After careful review and consultation with researchers from the University of Wyoming who are studying the problem, BLM feels that restoration to about the original productivity can be expected. About 125 acres a year will be disturbed and a timely program of mined land restoration acceptable to State and Federal authorities will be required, primarily under provisions of 43 CFR Part 23.

The draft review process revealed a clear cut need for monitoring long-term buildup of environmental impacts on air, ground and surface water, and the ecosystems involved.

C. ACTION PROGRAM FOR ENVIRONMENTAL PROTECTION

The Department of the Interior has independently evaluated the environmental impacts associated with the Jim Bridger steam electric powerplant and has compared these impacts with applicable Federal and State environmental standards. From these comparisons it appears that the plant's impact will comply with these standards. Moreoever, it is the Department's position that it is the responsibility of the Environmental Protection Agency and the State of Wyoming to enforce their standards. In consequence, the Department of the Interior will adopt the following action program:

A. No approval action on any right-of-way or other use authorization will be taken until the applicants agree to be bound by the stipulations located in Section VI of this Final Environmental Statement.

B. In managing the right-of-way program or other use authorizations the Department will cooperate fully with State and Federal regulatory and land management agencies to insure that the plant and its associated facilities operate within applicable laws, regulations, standards, and agreements.

C. The Department's Bureau of Land Management will require adherence to stipulations for all construction and other surface disturbing activities authorized on public lands.

D. The Department's Bureau of Sport Fisheries and Wildlife will require adherence to stipulations for all construction and other activities authorized on the Seedskadee National Wildlife Refuge.

E. The Fort Hall Tribal Council in cooperation with the Bureau of Indian Affairs is responsible for any special considerations in regard to its lands and interests.

F. The Department's Bureau of Land Management and Geological Survey are charged with responsibility for determining that mining and reclamation plans are approved only if found adequate to protect and restore surface values during and after strip mine operations.

G. The Department of Agriculture is responsible for any special considerations in regard to its lands and responsibilities.

II

PURPOSE OF PROPOSAL AND NEED FOR POWER

II. PURPOSE OF PROPOSAL AND NEED FOR POWER

The purpose of the proposed Jim Bridger complex is to meet the electric power needs of Idaho Power Company and Pacific Power & Light Company customers in Idaho and the Pacific Northwest.

The need for additional power is explained by the Federal Power Commission in their comments dated January 13, 1972, and repeated here in part for the convenience of the reader. (For full context of FPC comments, see XI D.)

> "The proposed project was planned as part of the '20-Year Hydro Thermal Program' of the Pacific Northwest's Joint Power Planning Council, a coordinating group composed of 109 electric utilities including the Bonneville Power Administration. The capacity of the Jim Bridger Generating Station is intended not only to meet the needs of the applicants but also to help fulfill the applicant's commitments to the regional coordinated program which envisions by 1980 the need for 21,000 megawatts of new generating capacity.
>
> "In view of the intended markets for the power from the proposed generating station, the need of its capacity can be judged against the demand-supply situation as it is expected to develop in the system of the Idaho Power Company in particular and the Pacific Northwest in general. According to the Draft Environmental Impact Statement, the Idaho Power Company is currently in need of the capacity of the proposed project. This is confirmed by the Company's 1970 Annual System Statement which shows that on December 31, 1970, the net dependable capacity owned by the Company was 1,226 megawatts while its annual peak load was 1,201 megawatts, representing a reserve margin of 2.1 percent. At the time of the 1974 summer peak, the Company's peak load is expected to reach 1,590 megawatts while available resources (those owned by the Company and net transfers) are expected to be 1,496 megawatts. This is a deficiency of supply over demand of 94 megawatts or a negative reserve margin of 5.9 percent without the Jim Bridger No. 1 Unit. If the No. 1 Unit is on the line as planned, the Company should meet the projected 1974 summer peak with a reserve of 406 megawatts, a reserve margin of 25.5 percent. Since the No. 1 Unit is now planned for June 1974 and the Company's annual peak usually falls in July, even minor slippage in the completion date of the unit would force the Company to depend on the Northwest Power Pool to meet its obligation to its customers.

"Based on the information available, the capacity of the Jim Bridger Generating Station is needed by the Idaho Power Company in 1974.

"According to data submitted by the Western Systems Coordinating Council, the estimated demand-supply situation of the Pacific Northwest Power Pool during the winter peaking season of 1974-75 will also be precarious. Against an estimated demand of 31,178 megawatts, the Pool can look forward to only 33,847 megawatts of dependable capacity including net transfers but excluding the capacity of Unit No. 1. Under these circumstances, the reserve margin will be 2,669 megawatts or 8.6 percent. When the capacity of Unit No. 1 is added to the expected resources of the Pool in 1974, the expected reserve margin is increased to 10.2 percent.

"For the 1975-76 winter peak, the generating reserves of the Pool are expected to increase to 4,065 megawatts, excluding the Jim Bridger Units No. 1 and 2, representing a reserve margin of 12.4 percent. With both units in service, the resulting reserve margin is 15.4 percent.

"For the 1976-77 winter peak, the Pool reserve margins are projected to be 9.9 percent without Units 1, 2, and 3 and 14.2 percent with all three in service.

"The Pacific Northwest Power Pool data submitted in response to FPC Order 383-2 show that approximately 91 percent of its generating resources were hydroelectric in 1970. By 1980 this percentage is shown to decrease to 83 percent as more thermal resources, such as the Jim Bridger Plant, are installed. The large number of small to moderately sized hydroelectric units make it possible to achieve a similar degree of reliability and adequacy of service with a lower percent of reserve margin capacity than a predominantly thermal system where the generating resources are concentrated in large, sophisticated steam-electric units. Nevertheless, in the case of the Pacific Northwest Power Pool whose network extends over large distances and difficult terrain, the staff of the Bureau of Power considers the reserves indicated to be too low to inspire confidence in the ability of the Pool to maintain reliable service and fulfill its power commitments. Furthermore, past experiences indicate realistic possibilities of construction delays in either the generating units, water pipeline, or mining operation involved in bringing this plant into service, as well as similar possible delays that could affect other bulk power system planned additions."

III

DESCRIPTION OF PROPOSAL

III. DESCRIPTION OF PROPOSAL

A. GENERAL

The Jim Bridger Project utilizes the concept that a resource could be developed in Wyoming for use in the Northwest without the necessity of additional transmission lines spanning the total distance from Wyoming to the Northwest. This concept was based on the fact that the Idaho Power Company had in existence a major 230 kv transmission system dedicated to delivering power from its hydro-generation plants along the Snake River on the Oregon-Idaho border easterly across the state of Idaho to its loads in southeastern Idaho. The existing transmission system would permit the transfer of power westerly over the same 230 kv transmission system from southeastern Idaho to the Oregon border.

The output of Jim Bridger is to be transmitted to southeastern Idaho for delivery to Idaho Power Company for their loads in Idaho and for redelivery at the Oregon border for Pacific's loads in the states of Oregon, Washington, and northern California. With one unit at Jim Bridger, the plant output will be dedicated to serving Idaho's loads. With the addition of the second unit, one-half of the total plant output will be for Idaho's loads and one-half for Pacific's loads. Similarly, with the addition of the third unit, one-third will be for Idaho and two-thirds for Pacific.

The Jim Bridger Thermal-Electric Generating Project consists of four component parts:

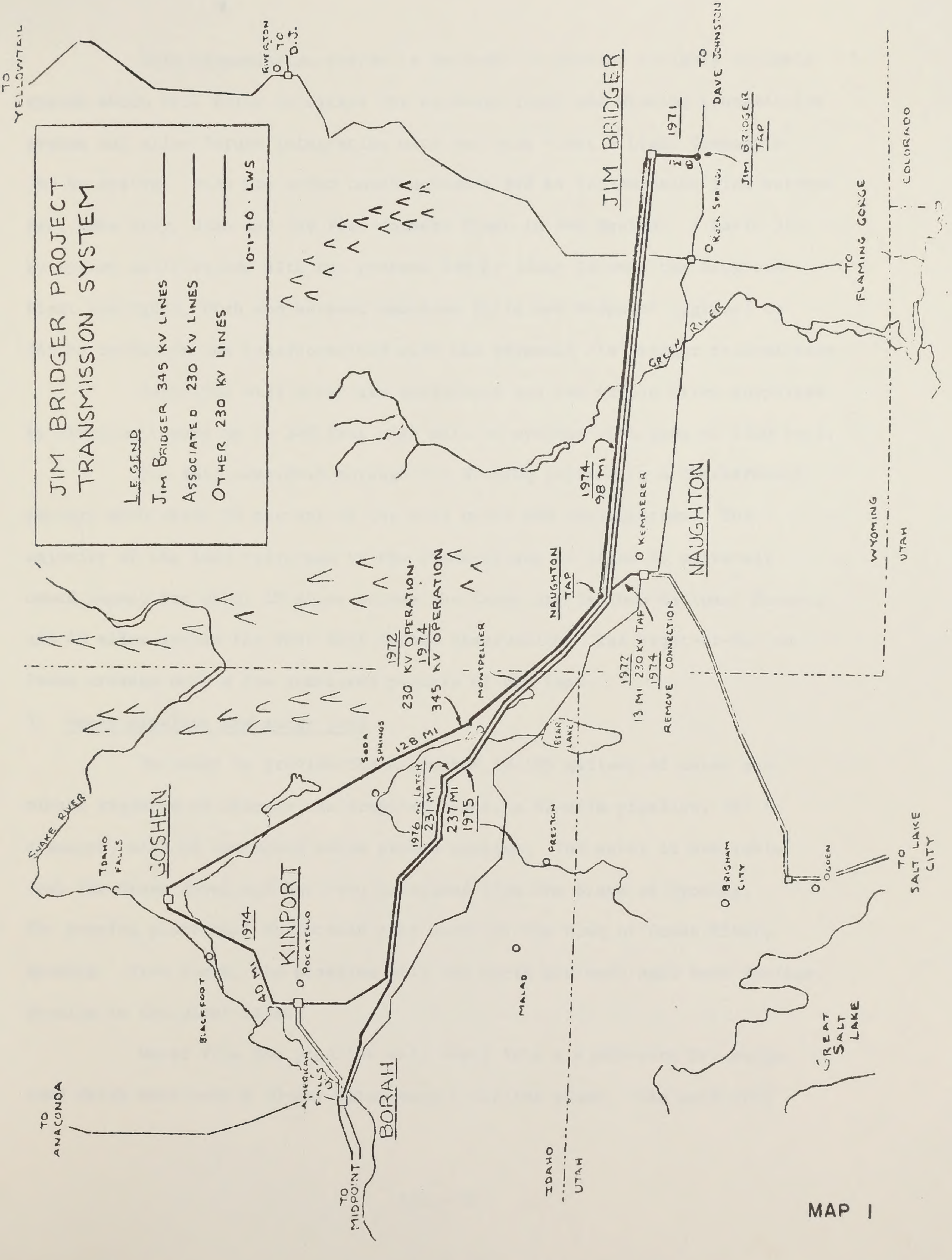
1. Coal-fired power plant (1500 MW in size)

The power plant is to be located on private land 35 road miles northeast of Rock Springs, Wyoming and six miles north of Interstate 80. There are no residents within four miles of the proposed plant. The plant site covers approximately 500 acres. It includes three 500 MW thermal-electric generators, cooling towers, switch yard, and coal storage area. A seven-mile spur railroad leading from the plant to the main Union Pacific Railroad between Rock Springs and Rawlins and a parallel access road serves the site. The height of this plant will be about 236'. The smoke stacks are expected to be approximately 500' in height. Each generating unit will consume 250 tons of coal per hour.

2. Three 345 KV transmission lines

The transmission lines proposed for the Jim Bridger project will be time sequenced such as to provide power to southeastern Idaho as generating units are added at Jim Bridger. In addition, a section of the first line to southeastern Idaho will be constructed early in order to eliminate the construction of previously planned 230 kv lines. The prime objective in the selection of the transmission system was to provide a reliable network.

The transmission system to be constructed will consist of three 345 kv lines from the Jim Bridger switchyard in southwestern Wyoming terminating at three major load points in southeastern Idaho, namely the Goshen Substation near Idaho Falls, the Borah Substation at American Falls, and the Kinport Substation at Pocatello. A 345 kv line will also be constructed between Goshen and Kinport and the necessary transformation will be installed to integrate the new 345 kv construction with the 161 kv system at Goshen and the 230 kv system at Kinport and Borah. Map No. 1 indicates the year of completion, mileage and approximate geographic location of these various lines.


JIM BRIDGER PROJECT
TRANSMISSION SYSTEM
LEGEND
JIM BRIDGER 345 KV LINES
ASSOCIATED 230 KV LINES
OTHER 230 KV LINES
10-1-70 · LWS
TO YELLOWTAIL
RIVERTON
TO D.J.
JIM BRIDGER
1971
TO DAVE JOHNSTON
JIM BRIDGER TAP
ROCK SPRINGS
TO FLAMING GORGE
COLORADO
GREEN RIVER
1974
98 MI
KEMMERER
NAUGHTON
NAUGHTON TAP
WYOMING
UTAH
1972
230 KV OPERATION
1974
345 KV OPERATION
MONTPELLIER
1972
13 MI 230 KV TAP
1974
REMOVE CONNECTION
BEAR LAKE
SODA SPRINGS
128 MI
1976 OR LATER
231 MI
237 MI
1975
PRESTON
BRIGHAM CITY
OGDEN
TO SALT LAKE CITY
SNAKE RIVER
IDAHO FALLS
GOSHEN
KINPORT
POCATELLO
1974
40 MI
BLACKFOOT
MALAD
GREAT SALT LAKE
AMERICAN FALLS
BORAH
TO ANACONDA
TO MIDPOINT
IDAHO
UTAH

MAP 1

This transmission system is intended to provide a highly reliable system which will fully integrate the southern Idaho and Wyoming transmission system and allow future integration with the Utah Power & Light Company's 345 kv system. Utah has under construction a 345 kv transmission line between Salt Lake City, Utah and the Four Corners Plant in New Mexico. A basic 345 kv system could evolve with the present 230 kv lines between the Naughton Plant and Ogden, Utah and between American Falls and Midpoint upgraded to 345 kv operation and interconnected with the proposed Jim Bridger transmission.

Each line will carry six conductors and two shield wires supported by aluminum towers up to 140 feet high with an average line span of 1300 feet.

The land ownership through the Wyoming portion is a checkerboard pattern with about 50 percent of the area under BLM jurisdiction. The majority of the land traversed by the right-of-way in Idaho is privately owned except for about 10 miles across the Cache and Caribou National Forests and 45 miles across the Fort Hall Indian Reservation. The right-of-way in Idaho crosses only a few scattered parcels of BLM land.

3. Water pipeline and surge pond

In order to provide the estimated 18,100 gallons of water per minute required to operate the proposed plant, a 42-mile pipeline, 36" in diameter, will be installed below ground surface. The water is available from the Green River and has been purchased from the State of Wyoming. The pumping plant will be located just north of the town of Green River, Wyoming. From there, the pipeline will run north and east past Rock Springs, Wyoming to the plant site.

Water from the pipeline will empty into a 1,000-acre ft. surge pond which will hold a 10-day water supply for the plant. The pond will back up behind a 42-ft. high earth dam across a shallow draw. It will cover approximately 80 surface acres.

4. Strip mine for coal

The coal necessary to operate the power plant will be mined from a 5,000-acre tract lying approximately four miles northeast of the plant site. Coal lands under lease to the power companies from the Union Pacific Railroad Company and the U.S. Bureau of Land Management total 18,000 acres. The coal field contains an estimated 130 million tons of coal having an overburden of 120 feet or less. In addition, the coal field contains at least 115 million tons of deferred reserves under higher overburden cover. The coal is found in two horizontal seams ranging up to 30 feet in thickness. In response to the draft statement, several parties noted an inconsistancy in computing the total amount of coal to be consumed.

It has been the experience in the electric power industry that a steam plant will operate close to 50% capacity factor during its expected life. Historically, newer units have higher efficiencies and less maintenance due primarily to advances in technology. Thus, newer units should be used for base load and older units for peaking and reserves.

Applying this experience to the Jim Bridger Project, the three units can be expected to operate initially at an annual capacity factor of approximately 85%, dropping to 50% after 15 or 20 years and further dropping to 10% or less after the expected 35-year life of the units. Overall, an average capacity factor of 50% over the 35-year period can be expected. This will represent an anticipated coal requirement of some 115 million tons for the three generating units.

Plans call for strip mining an average of about 125 acres per year.

The overburden will be removed with large draglines casting to one side as coal seams are uncovered. The coal will then be loaded into 120-ton trucks and hauled to the plant site. The overburden from the next strip will be deposited in the trench created by the earlier stripping.

B. SUMMARY OF STATISTICS OF JIM BRIDGER PLANT

Location:	35 road miles northeast of Rock Springs, Wyoming (Sec. 3, Twp. 20 North, Range 101 West, 6th P.M.)
Elevation:	6,700 feet at the site
Units:	Three (3), costing approximately $300,000,000
On Line:	#1 3-74; #2 6-75; #3 '76 or later
Owned:	Jointly: Idaho Power Company - Pacific Power & Light Company
Operated:	Pacific Power & Light Company
Steam Gen.	
(Boiler)	(Combustion Engineering Company
Rated:	(3,930,000 pounds per hour
Size:	(206' high x 56' wide x 49' deep
Weight:	(12,000,000 pounds per unit
Turbine Gen.	
Rated Kw:	(508,558 Kw, Max. Output 552,967
Kva:	(Generator: 590,000 Kva
Size:	(131 feet long
Weight:	(1,000,000 pounds per unit
Coal:	(250 tons/hr. for each unit, full load, 10,000 BTUs/lb., (10% Ash, 0.6% Sulphur, 20% Moisture
Mine:	(Approx. 15 miles long, with seams approx. 30' deep, (and with 35 years of coal by stripping to 120 feet
Coal Haul:	3 to 10 miles with 120-ton, bottom dump trucks
Drag Lines:	55 cu. yds. with 300' boom; 14 cu. yds. with 175' boom
Shovel:	16 cu. yds. w/approx. 11 tons of coal per dip

(Drag lines & shovel electrically operated)

Pipeline:	42 miles, 36" dia. pipe, 800' static lift
Est. Water:	18,100 gallons per minute
Consumption:	29,200 acre feet per year, or 40 cu. ft. per second
Surge Pond:	80± surface acres; 1,000 acre feet
Railroad:	7-mile spur from Point of Rocks

Cooling Towers: ea.	342' long x 68' wide x 63' high
Chimneys:	Approximately 500 feet high
Flue Gas under Full Load	With Precipitator, 2,160,000 cu. ft. per min. @ 250° F. With wet scrubbers, 1,900,000 cu. ft. per min. @ 170° F. 5,700,000 pounds per hour
Building:	
Height:	236 feet
Length:	710 feet
Width:	305 feet
Transmission Lines	345 Kv; 235 mi. long, consisting of: 1-Borah (American Falls) 1-Kinport (Pocatello) 1-Goshen (Idaho Falls)

C. INTERRELATIONSHIP BETWEEN JIM BRIDGER AND OTHER PROJECTS OR PROPOSALS

Jim Bridger will be an addition to several existing operations in the upper Green River Basin that extract or process mineral resources. Coal is mined in the Rock Springs-Reliance areas; there are two Wyoming plants burning coal to produce coke -- one located south of Rock Springs, the other near Kemmerer; trona is mined and processed into soda ash north and west of the town of Green River. The coal and trona industries have announced major expansions. Along with their expansion plans, the trona mills are working with the Wyoming Air Quality Council to abate their emissions of particulates and gases. In addition to coking plant emissions, additional strip mining for coal in the Rock Springs-Reliance area will also add dust to the air and perhaps affect water quality.

The Jim Bridger site lies about 100 miles east of the coal-fired Naughton Steam-Electric Plant near Kemmerer and 175 miles southwest of the Dave Johnston Plant near Casper. Both plants are presently being expanded and the new units will be equipped with particulate removal equipment.

There are several petroleum fields in southwestern Wyoming. The Lost Soldier field is located some 70 miles to the northeast of the plant site. There is also considerable oil and gas production in the vicinity of LaBarge 75 miles northwest of the plant. The nearest field is at Bitter Creek 25 miles southeast of Jim Bridger. The proposed transmission line does not traverse any significant oil or gas fields, however, there may be some individual wells in close proximity to the line.

Besides these known mineral uses, oil shale development is a potential resource based industry. Recently announced national policies indicate a good possibility for pilot oil shale lease offerings in the near future. The location and extent of oil shale development cannot be predicted at this time, but it is known that the Jim Bridger powerlines cross part of the oil shale beds northwest of Rock Springs.

IV

DESCRIPTION OF THE ENVIRONMENT

IV. DESCRIPTION OF THE ENVIRONMENT

A. EXISTING AIR QUALITY

The Air Quality Act for Wyoming, signed on March 3, 1967, empowers the State Department of Health to enforce the policy of the State -- to maintain a reasonable degree of purity of the air resources. To date no monitoring programs to determine ambient air quality of the Rock Springs vicinity have been initiated by the State. Results of air sampling conducted by the companies around the Jim Bridger plant site in 1971-72 indicate that existing air quality is quite good. The median background level for particulates is between 15 and 40 micrograms per cubic meter. Measurements of SO_2 background near the plant indicate low values. The visibility range almost always approaches the unlimited in the vicinity of the plant. One exception is during the frequent periods of high winds when dust (and larger) particles are airborne.

In the near term, regional air quality is expected to improve as the trona and coke industries come into compliance with State laws. Expanding strip mining and developments associated with coal and uranium plus as yet unknown impacts of oil shale development can be expected to have detrimental effects on air quality in the longer term.

B. EXISTING WATER QUALITY - GREEN RIVER BASIN

The following quotation is the most recent comprehensive discussion of current water quality available:

> "Physical and chemical quality monitoring is done continuously through a joint program of the U. S. Geological Survey, the Wyoming Department of Agriculture, and the Wyoming State Engineer's Office. Twelve sampling stations (ten for chemical, two for sediment) are located within the Basin.
>
> "Due to the adoption of water quality standards, the Wyoming Department of Public Health has initiated a monitoring program at selected sites to detect serious bacteriological contamination in Green River Basin streams from May to September. Bacteriological contamination is an important indicator, and, if excessive, the indicated pollution is relatively easy to correct through conventional water treatment such as chlorination.
>
> "The Wyoming Department of Public Health has established radiological monitoring stations on the Green River at Daniel, Green River, the Fremont Lake outlet, and also on the New Fork River near Pinedale and Big Piney. The monitoring program is to collect background data for an historical base reference period. . . . .
>
> "The availability data generally indicate that the waters of the Green River Basin are of excellent bacteriological, radiological, chemical, and physical quality, although salinity from natural sources and return flows increases in the lower reaches of some streams. Salinity is the most difficult water quality problem to trace and is the most costly to treat.
>
> "There are two basic causes of salinity increases in a stream, and they need to be distinguished. These are the 'salt loading' and 'salt concentrating' effects. Salt loading is produced by the discharge of additional minerals from municipal, industrial agricultural, or natural sources into a stream. The salt concentrating effect occurs as a result of the diversion and consumptive use of water. In this case, the salt load diverted and returned to the stream is the same, but there has been a consumption of pure water and a loss of this water from the system which increases the concentration.
>
> "Few irrigation return flows are monitored in the Basin, and therefore it is difficult to quantify the salinity contribution. Observations since 1955 by the U. S. Bureau of Reclamation at the Eden Project in Sweetwater County show salt yields ranging from two to six tons per irrigated acre per year. . . . .

> "At present, most area industries use 100 percent of their diversions. Except for the fact that this reduces the capability of the stream to dilute other salinity sources, this has no effect on salinity." 2/

Based on the above it can be concluded that the waters of the Upper Green are of high quality at this time, with the exception of salinity which is about 307 PPM.

2/ State Engineer's Office, Wyoming Water Planning Program Report No. 3, Water & Related Land Resources of the Green River Basin, Wyoming. September, 1970.

C. GEOLOGY

The Jim Bridger plant site and coal mine are located along the northeastern flank of the Rock Springs Uplift. The uplift is an anticlinal structure (dome shape), having an elongated pattern and a north trending major axis. Rock layers on the flanks dip three degrees or more toward the adjacent structural lows. The layered sequence is repesented by sedimentary rock formations of upper Cretaceous and lower Tertiary age that are clearly visible by high-walled rock faces or escarpments. Other structural features near the vicinity of the power plant site are the Washakie Basin to the southeast, a structural basin characterized by high rock rims, and the Great Divide Basin lying to the east having similar characteristics.

Stream drainage is toward Bitter Creek, which flows westward across the middle of the structure to the Green River. Ninemile and Tenmile draws flow intermittently in response to runoff from precipitation and discharge from springs.

The plant site rests upon the Almond formation near the contact with the Lewis shale formation. The Almond formation is composed of sandstone, siltstone, carbonaceous shale, and coal. Bedrock is mantled by light colored soils over most of the plant site. The Lewis formation is a light to dark gray, calcareous to noncalcareous shale, beds of siltstone, and fine grained sandstone.

The coal field lies about three miles east of the plant site and trends for about 15 miles in a northwesterly direction. Coal occurs at the base of the Fort Union formation (Paleocene Age) immediately above the Lance formation (Cretaceous). Coal thickness is about 30 feet at the north end of the field. Towards the south, it splits into two seams, each of which is between 12 and 15 feet in thickness. A dip of about two degrees toward the east and northeast is typical throughout the coal field. Mining will result in removing a maximum overburden of approximately 120 feet, with an overall stripping ratio of about four yards of overburden to one ton of coal. Testing of the coal results in its classification as a high volatile, sub-bituminous "B" with variable heating values averaging near 9,700 BTU's, ash content around 10%, moisture of 17%, and a sulphur content of less than 0.75%.

The Fort Union formation in southwestern Wyoming varies from 700 to 2700 feet in thickness and is composed of fine to coarse grained sandstone, carbonaceous shale, and coal. In the vicinity of the proposed mine, shale is the dominant rock type. As mining progresses, this material will be placed back into the open pit as fill. As it becomes compacted, it can be expected to accept water at relatively low rates. Rates of acceptance of water will be lower with depth, greater compaction, and with a higher portion of shale relative to coarser grained sandstone.

The Lance formation is composed of very fine to fine grained, clayey, calcareous, lenticular sandstone; dark-gray or brown shale; coal; and lignite. This formation is an excellent floor for the mining pit since it will not transmit groundwater to lower aquifers and will hold only limited amounts of groundwater in the relatively impervious sandstone lenses.

Most of the Cretaceous rocks flanking the uplift (east of the proposed mine) are good sources of water, especially near their outcrops for several miles down dip. Water samples from these formations contain as high as 6000 PPM in dissolved-solids down dip but analyze as low as 300 PPM to 800 PPM near their outcrops. Most of the water wells that flank the uplift tap one or more of the sandstone beds of these formations. Sandstone in the formations is generally fine to medium grained. Ten flowing wells in the vicinity of the plant site produce from 2 to 470 gallons per minute from depths ranging from 160 to 6000 feet.

D. SOILS

Soils information in this area is practically nonexistant, however, some indication is available from investigations conducted by Woodward-Clyde Associates for the Companies with regard to the plant construction site.

"The soils across the western half of the plant site are mainly silty sands derived as slopewash and residual debris from the Almond sandstone. Locally these are capped by, and inter-lensed with wind-deposited sands. These soils grade eastward, across the sector of the plant underlain by the Lewis Shale, to inter-lensed silts, sands and clays. Surficial sand dunes are better developed in this sector of the plant site.

"The western edge of the alluvial plain of Deadman Wash encroaches across the eastern end of the plant site in a narrow irregular shaped bank. Deadman Creek, in past geologic history, has eroded its bed to a depth of 75 feet or more below the present level of the Wash, and then regraded the valley to its present floor level with lenticular-bedded sands, silts and clays.

"1. Overburden

The dune sands and silts (SM to ML by the Unified Classification System) in the vicinity of the turbine-generator building to the west are generally of low density, 103± pcf. Locally they are calcareously cemented to form a hard "caliche-like" layer.

"The alluvial soils at the easterly edge of the site, below the low density surface silt, are dense and are predominately sands containing interlayered silts and clays and a few thin layers of fine coal dust.

"2. Almond Sandstone

The thin overburden in the western part of the site is underlain by the Almond Sandstone, as is the Lewis Shale in the eastern part of the site. The sandstone generally has a hard cap layer 3± feet thick. Where the cap is exposed, it is generally highly fractured and frequently underlain by highly altered, very weakly cemented, thin bedded, somewhat porous sandstone. This very weakly cemented zone is up to 10 feet in thickness and contains some harder layers. It is underlain by variable, but generally moderately cemented, hard

> sandstone which contains layers of weakly cemented and strongly cemented sandstone and pockets and lenses of very weakly cemented to uncemented sandstone, as well as occasional layers of very hard, limy, fossiliferous sandstone and claystone.
>
> "3. Lewis Shale
>
> The overburden in the eastern part of the site is up to 78 feet thick and is underlain by claystone of the Lewis Shale Formation. The upper stratum of the claystone, up to 50 feet thick, ranges erratically from firm to hard and contains many fractures filled with clay and selenite, a water-soluble form of gypsum (calcium sulfate). The deeper claystone is generally hard to very hard, thicker bedded, sometimes limy and no evidence of gypsum filled fractures was found." 3/

A general soils map legend for this formation as well as the Lance and Fort Union formations used by the Soil Conservation Service describes the soils as being "nearly level to steeply sloping; shallow, moderately deep, and deep; sandy, loamy, and clayey soils in complex with alkali soils on saline-alkaline bearing shales of Bridger, Green River and Wasatch formations. Scattered areas of badlands, sand dunes, and playas occur in this association."

While vegetative studies to date have not identified selenium bearing or indicator plants (Aster, Astragalus, Oxytropis, Stanleya) in the vicinity of the coal mine, it is known that the Lewis and Fort Union formations are capable of supporting a scattered to dense growth of such plants. The natural mixing of soils from all depths in a strip mine operation could conceivably bring selenium bearing material to the surface in the spoil banks. Vegetation control, fencing or other measures may be necessary for the protection of domestic livestock.

3/ Material excerpted from the Woodward-Clyde Associates investigations

E. EXISTING ECOLOGY (Flora and Fauna)

In the interest of brevity, much of the draft material has been condensed here and additions based on comments received put in as appropriate.

The life zones involved in the Jim Bridger Project can be grouped into two major associations, (1) the DESERT SHRUB COMPLEX and, (2) the MONTANE FOREST-MOUNTAIN SHRUB COMPLEX. Although some species of plants and animals are found in both areas, they are easily separated by topography and dominant vegetation.

1. Desert shrub complex

a. Physical characteristics

Elevation ranges from 5500 to about 7,000 feet above sea level. There is an annual rainfall of 6 to 15 inches and the frost-free growing period varies from 90 to 120 days. 4/ The dominant soils have loamy surface layers with low organic matter content. Shrubs dominate the vegetation. Low growing, salt tolerant shrubs such as the salt bush, shadscale, and bud sage occupy the lower, drier sites, while big sagebrush with a mixed mid-grass understory characterizes the higher, more moist sites. The terrain is rolling bench lands cut by north to south trending drainages. The Green River, a tributary of the Colorado River, is the major drainage.

b. Major ecological relationships

The shrubs that give this complex its name support a wide variety of wildlife and other fauna. A wildlife species listing of

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4/ State Engineer's Office, Wyoming Water Planning Program Report, No. 3, Water and Related Land Resources of the Green River Basin, Wyoming, September 1970.

southwestern Wyoming would include approximately 200 birds, 70 mammals, 20 fishes, nine reptiles and five amphibians. Major relationships include: critical winter feed for antelope; winter feed for mule deer; feed, cover and nesting sites for sage grouse in their year-round habitat; a primary hunting ground for raptors; and winter forage for domestic livestock. Small animals such as rabbits, chipmunks, ground squirrels and mice inhabit this zone and complete a link in the food chain for gold eagles, red-tailed hawks, badgers, coyotes and less common predators. Streams are commonly bordered by a ribbon of meadow and other streamside vegetation supporting populations of native and introduced fishes, ducks and geese, muskrats, beaver, song birds and water oriented reptiles, amphibians, rodents and shore birds.

The potential for wildlife development is largely management oriented. As management for wildlife is introduced on an intensive basis, populations can be expected to respond favorably if not dramatically. Population response to management, or to interference with normal life habits, has probably been most pronounced with elk, mule deer and antelope on public lands and with water fowl on withdrawn lands such as the Seedskadee Wildlife Refuge. Frequency of human visitation and destruction of habitat are two of the major problems in wildlife management. At the same time, human intervention, by way of providing additional water developments and carefully planned land treatment programs have been instrumental in improving this arid zone as a wildlife habitat.

The desert shrub vegetation is relatively stable under existing extensive land uses. Grazing in all seasons, oil and gas exploration, roads, railroads and mineral development such as coal mining and trona processing have all disturbed the ecology. Due to this disturbance, changes in microclimate, flora, fauna and food chains have taken place, but have been limited to the sites where disturbance occurs. Accelerated erosion is imminent when the surface vegetation is removed. If erosion takes away the thin mantle of soil containing organic matter, long-term damage results. Reseeding disturbed areas with introduced species is possible, but moisture and seed bed conditions must be favorable. Failure to reintroduce permanent vegetation often results in invasion of the area by noxious or poisonous weeds.

c. Economy and Land Use

Grazing, transportation, mineral extraction and outdoor recreation are the major uses. Outdoor recreation in the form of hunting, rockhounding and off-road vehicle use has increased significantly in recent years and can be expected to grow commensurately with local and regional industrial development. Communities are small (10,000 people and under), widespread, and located along major transportation routes.

The areas where the Desert Shrub complex occurs do not lend themselves to intensive land use. Irrigation water is required for farming, and yields are low compared to lands in the more favorable climate occurring at lower elevations.

2. Montane Forest-Mountain Shrub Complex

a. Physical characteristics

This vegetative complex contains a diverse combination of valleys, bench lands, rolling foothills, steep mountain slopes and ridges. Most mountain ranges are oriented north-south. Elevations range from 5000 to 8500 feet and precipitation varies from 12 to 40 inches per year according to elevation.

Soils, like landform, vary greatly. Montane Forest soils are typically cool and moist with a dark surface layer. Bedrock may be exposed on ridges; deepest soils occur in swales. Mountain Shrub associated soils occupy the lower to mid-portion of mountain slopes down to alluvial fans and lakebed terraces near the valley floors. These soils are warmer and have less organic matter in the surface horizon than the high elevation soils.

Shrub species of juniper, sagebrush, mountain mahogany, and bitter brush with a grass understory are quite representative of the Mountain Shrub Zone. As effective precipitation increases (primarily due to elevation and aspect), the Shrub Zone grades into a forest overstory of Douglas-fir with a shrub-grass understory. High meadows and groves of quaking aspen are common throughout the higher elevation zone.

b. Major ecological relationships

Rain and snow at higher elevations are important sources of water yield for adjacent valley bottoms and arid portions of the region. The natural environment supports a wildlife population of diversity similar to the Desert-Shrub zone. Winter habitat has been reduced by agricultural activities in the valleys and is, therefore, a limiting factor, especially to big game species dependent on native forage and freedom of movement during the winter season. The opportunity for expansion of the wildlife resource in the lower elevation reaches is dependent on a high degree of cooperation from private land holders and orientation to those species adaptable to at least a semi-agricultural environment, such as small fur bearers and upland game birds.

The high elevation Montane Forest areas involved are generally undisturbed and in a natural condition except for the impact of livestock grazing, limited mining, timber harvest and human use. Access into these areas is poor, primarily because of steep terrain. The Mountain Shrub zones below the forest and adjacent valleys have been drastically altered where dryland or irrigated farming has been initiated. Wildlife populations and the opportunity for further development for big game is limited primarily by the availability of winter habitat in the valley bottoms.

Unlike the Salt Desert Shrub zone, the natural capacity of native vegetation to heal or revegetate disturbed areas is relatively good. However, removal of the vegetation and/or the top soil, combined with the steep topography, creates a high erosion hazard until ground cover is reestablished. Natural or geologic rates of erosion are estimated to be low.

F. SETTLEMENT PATTERNS

The Union Pacific Railroad with its need for manpower, not only to build and operate the railroad but also to mine coal for fuel, dominated other factors that determined the population make up of southwest Wyoming. Underground mines centered around Rock Springs attracted people because work was available. The railroad also offered an easy route to market for large ranches. Ranch headquarters are typically found scattered along the rivers and larger streams where irrigation water is available. Between the water courses, mile upon mile of unpopulated land is found. Well over two thirds of the population now live in towns and communities.

G. ECONOMY AND CULTURAL PATTERNS

The social, economic, and cultural patterns of Wyoming and Idaho have been, for the most part, formed by the same forces. Having more water available in Idaho has led to more intensive agriculture and increased the population there as compared to southwest Wyoming. A brief description of Sweetwater County, Wyoming, follows because it is by far the area most heavily affected by the project.

This county is one of the fastest growing areas in Wyoming, with a projected growth in population from 18,391 in 1970 to 27,700 in 1980. The county's trona industry, oil and gas production, and coal mining dominate the basic industries of the Green River Basin in Wyoming. The Basin had an industrial employment of 2,186 in 1967 and a projected growth to almost 5,000 for 1980. The payroll is expected to grow from 19 million to 44 million in the same period. (All data 5/).

Rock Springs and Green River are the trade centers of the region. A combined service and retail employment sector of 3,599 people is expected to grow moderately as the Government and recreational service elements increase 6/. Interstate 80 traffic supports motel and restaurant services beyond that expected in a town the size of Rock Springs.

Agriculture, with its 250 employees 6/ and 5-1/2% 5/ of the county's assessed valuation, is not expected to exhibit a large growth in the next decade.

5/ State Engineer's Office, Wyoming Water Planning Program, Report No. 3, Water and Related Land Resources of The Green River Basin, Wyoming, September 1970.

6/ Unpublished data made available by the Rock Springs school system.

Sweetwater County exhibits a diverse ethnic and cultural makeup because of the employment available during the different periods of immigration. Because mining and power production will not change traditional employment patterns, cultural values will not be disrupted by implementation of the proposal.

H. CULTURAL VALUES

1. Unique Communities - Rare Species

In nature, each plant and animal community is unique to the biologic, geologic and climatic setting or microclimate in which it occurs. The plant and animal communities along the proposed route of the transmission line are no exception, however, they repeat themselves frequently and are not unique in the sense of being rare or indigenous only to a given locality. Recognized rare and endangered species in Wyoming include eight mammals, ten birds and three fishes. Many other species of vertebrates are sighted only infrequently and their true abundance is not known.

Each major ecologic zone encountered by the Project occupies hundreds of square miles. While these zones are the habitat for several rare and endangered species no single area can be viewed as critical to their survival and no colonies or other concentrations are known to exist in the path of the Project.

For a more thorough, but still general, treatment of the interrelationships which exist in this region two documents are recommended to the reader. They are: (1) Upper Colorado Region, Comprehensive Framework Study, Appendix VI - Land Resources and Use, and (2) Columbia North Pacific Region, Comprehensive Framework Study, Appendix VIII, Vol. 1. See list of references for full citation.

2. Wild and Scenic Rivers

The transmission lines cross several rivers and streams, none of which have been proposed for study under the Wild and Scenic Rivers Act. The Upper Green River is the closest designated study river, but the concerned reach is far upstream from the line crossing.

I. RED DESERT MANAGEMENT STUDY

The plant site is situated about 25 miles inside the west boundary of the Red Desert planning area. This 5 million acre area stretching east some 120 miles from the plant is undergoing an intensive analysis of both the values found there and the increasing conflicts between resource users. The management study is designed to resolve these conflicts. Both local and national levels of various conservation and wildlife groups have expressed interest in this largely unfenced area. They have placed particular emphasis on establishing an antelope range. The resource values identified in the Red Desert unit resource analysis and the land use potentials and conflicts brought out in the proposed management framework plan have been carefully considered and incorporated throughout this report.

J. FUTURE TRENDS

The major land uses of livestock grazing, outdoor recreation, dry land and irrigated agriculture, and mineral extraction are expected to be viable in the future. Degrees and areas of use, however, may shift in importance.

Mineral extraction is expected to increase in Wyoming, involving oil shale, trona, coal, oil and gas, and phosphate. Primary and secondary milling and processing may occur at or near the site of extraction. The availability of water may be a constraint limiting the extent of secondary treatment as well as the establishment of allied or kindred type industry. The phosphate industry in southeast Idaho is thought to be in an excellent competitive position nationally, and significant production increase is expected by 1985[7].

Outdoor recreation is expected to become increasingly important, particularly for extensive type uses such as hunting, rock and mineral collecting, fishing, and greater use of snowmobiles and off-road vehicles.

The area will likely have "pockets" of economic activity and development associated with resource extraction. On a regional basis population increases will be low to moderate in comparison to national gains. In local situations such as the Rock Springs-Green River locale where current trona processing and coal mining is active, a faster growth rate can be expected. In addition to the current activity

[7] USDI, Bonneville Power Admin., Pacific N.W. Economic Base Study for Power Markets, 1970, p.69

and rumored plans for expansion, a prototype oil shale leasing program is being proposed in the vicinity of Kinney Rim some 40 miles southeast of Rock Springs, the nearest major community. In the case of each of these communities and their associated areas, the inevitable transition as development proceeds, will be from a rurally oriented society to one of greater urbanization and industrialization. Over the long term, the broadened Federal, State and local tax base will make possible increased community services, and the increased income in each area will make possible increased economic opportunities at all levels. A disruptive impact will be the lag between increased demand for community services (schools, hospitals, roads, municipal services, etc.) and the ability of local government to finance the services required. Such a lag will also be felt in the private sector (housing, retail stores, physicians, garages, etc.) due to reluctance by private business to respond to new demands for goods and services which are the result of increased, but temporary, construction employment. With time, these lags will tend to disappear as production levels stabilize, permanent employment replaces construction employment and the newly expanded communities begin to mature. The "support" employment required to furnish the increased goods and services required by the new industry personnel can be expected to approximate a one-to-one ratio with direct employment and will be a factor in community growth.

Without the Bridger Project it is quite safe to assume that alternative power projects would be proposed, and perhaps constructed in the region. This is based on the projected power needs and the fact that advance planning was underway on an Idaho Power coal-fired plant near American Falls, Idaho prior to adoption of the Bridger proposal.[8]

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[8] Company Report, pg. 15

V

SUMMARY OF ENVIRONMENTAL IMPACTS

V. SUMMARY OF ENVIRONMENTAL IMPACTS

The Second Draft Environmental Impact Statement for the Jim Bridger Thermal-Electric Generating Project contained a comprehensive environmental analysis of the Project. The evaluation procedure which was used was one described in Circular 645 of the U. S. Department of the Interior, Geological Survey.

The few comments received with respect to the matrix system were favorable and concerned primarily with the technique used and the utility of the procedure as a device for identifying impacts and assigning relative importance thereto. For the sake of brevity and to forego repetition the detailed explanation of the matrix system, the matrices and the impact assessment statements are not included in this report. They can be found in Appendix A and B of the Second Draft Statement.

To briefly explain the procedure, all proposed actions were evaluated individually against each of 88 characteristics of the existing environment. Any resulting impact was given a numerical rating of 1 to 10 in terms of both the magnitude and the importance of the action on the environmental characteristic. In both cases a rating of 10 represented the greatest impact. The term "magnitude" was used in the sense of degree, extensiveness or scale and was intended to exclude preference or bias and to be made as much as possible on factual information. The evaluation of "importance" was principally a value judgement on the part of the evaluators and considered the consequence or significance of changing a particular condition on other factors in the environment. A total of 100 possible proposed actions were considered in the analysis.

A separate analysis was made for each of four major facilities; the generating plant, transmission lines, coal mines, and water supply system. The major impacts identified respectively for the four facilities were concerned with: atmosphere, flora, fauna, aesthetics and cultural status; erosion, land use, aesthetics and man-made facilities; atmosphere and cultural status; water, erosion, recreation and man-made facilities.

A. GENERATING PLANT AND RELATED FACILITIES
(Plant, Railroad Spur Line, and Paved Access Road)

1. Stack Emissions

The portion of the proposed power plant complex identified on the matrix as having the greatest interaction and affecting the listed environmental characteristics most often is stack emissions. In fact these emissions are potentially as significant as all other environmental impacts combined.

On the basis of meteorological data and design criteria available at the time the draft was written, an independent analysis and predictive model was prepared by the Bureau of Reclamation working with the Tennessee Valley Authority. The results of this analysis are added to this report as Appendix A.

A report by the Owners' Consultant concerning stack height and ground level concentrations for sulphur dioxide, particulates and nitrogen oxides is included as Appendix B.

The following information was received from Pacific Power & Light Company on August 16, 1971. It reflects their estimate of emissions under certain assumptions.

a. Jim Bridger Plant Emissions

> "The following emissions are based upon analysis of all of the core samples taken from the coal field. The maximum concentrations of all substances will not occur at the same time since the extreme of each substance as shown results from different core samples in different parts of the coal field. Similarly, minimum concentrations will not occur simultaneously.
>
> "These emissions are for one unit based upon maximum load with turbine valves wide open, 5% over pressure, 20% excess air, and normal expected air leakage into the boiler casing. The concentrations are on a dry gas basis.

Substance		Core Sample No.	Lb./Hr.	Ton/Day	PPM (by volume)
Particulates	Max:	225 FC	325	3.9	64 (by weight)
	Min:	115	197	2.4	39 (by weight)
SO_2	Max:	125	7,840	94.1	715
	Min:	236	3,640	43.7	342
NO_x as NO_2	Max:		3,900	46.8	500
	Min:		Data not Calculable		
CO	Max:		75	0.9	16
	Min:		Data not Calculable		
CO_2	Max:	146	1,080,000	12,900	145,000
	Min:	244	1,045,000	12,500	143,100
H_2O	Max:	131	317,000	3,800	104,500
	Min:	119	251,000	3,000	82,200

"Particulate emissions will decrease as loads decrease, but at something less than a direct proportion. SO_2 emissions are expected to decrease in direct proportion to load reduction. The SO_2 emissions listed above are based on an assumption that all of the sulphur in the coal is converted to SO_2. In fact, only the organic sulphur is oxidized and emitted as SO_2, while the sulphates remain in the ash, and the pyritic sulphur is largely discarded in the coal pulverizers and as bottom ash. Thus, actual SO_2 emissions will be less, and may be substantially less, than shown.

"Nitrogen oxide emissions decrease with load reduction due to lower peak flame temperatures. NO_x control provisions to be installed in the furnaces by the Companies are expected to reduce nitrogen oxide emissions below those listed in the above tabulation.

"Carbon monoxide data has been taken from Public Health Service Publication No. 999-AP-35. Carbon dioxide and water vapor emissions are directly proportional to the amount of fuel consumed and are thus proportional to plant loads. Water vapor is also dependent on the humidity of the ambient air.

"Spectrochemical analysis of selected core samples indicated the absence of mercury and fluorine, but showed a trace of lead in some samples. Some ozone will be produced in the electrostatic precipitators, but is expected to be a very small amount."

There was little information at hand to assess either stack emissions or their impacts at the time the draft was prepared.

Responses to the draft brought out much more information, some of which is in conflict. The following analysis attempts to settle disputed points using information furnished by the Companies and others. It is organized to answer three questions: (1) Will the plant comply with State and Federal air quality standards? (2) What will be the effects of emissions even if they do comply?, and (3) What guarantees are there that equipment will function as designed and who will monitor the Companies' operation to see that they carry out their plans for maintaining air quality.

b. Relationship Between Emissions and Standards

Table 6 prepared by Pacific Power & Light Company at BLM's request, relates their latest estimates of emissions to Wyoming and Federal standards. To allow comparison, the standards of nearby States are shown in Table 7. A discussion of three substances - particulates, oxides of nitrogen and sulphur dioxide follows the tables. The EPA's New Source Emission Standards have been included, even though Jim Bridger is excluded from coverage because it was underway prior to the standards' effective date.

JIM BRIDGER PROJECT

POWER PLANT EMISSIONS AND AMBIENT AIR QUALITY

Substance	Wyoming Standard	EPA Standard	Jim Bridger (3 Units)
A. Particulate			
Emission	0.18 lb/10^6 BTU in	0.10 lb/10^6 BTU in	0.072 lb/10^6 BTU in
Ground Level Concentrations	200 ug/m^3 (24 hrs. max.) 75 ug/m^3 (annual mean)	150 ug/m^3 (24 hrs. max.) 60 ug/m^3 (annual geo. mean)	4.0 ug/m^3 (24 hrs. max.) $<$1.0 ug/m^3 (annual)
B. Sulfur Dioxide			
Emission	No direct standard for emissions	1.2 lb/10^6BTU in	0.548-1.17 lb/10^6BTU in (1)
Ground Level Concentrations	0.02 PPM (annual avg.) 0.10 PPM (24 hr. avg.)	0.02 PPM (annual arith. mean) (4) 0.10 PPM (24 hr. max.) (4) 0.5 PPM (3 hr. max.) (4)	0.004 PPM (annual max.) (2) 0.026 PPM (24 hrs. max.)(2) 0.094 PPM (3 hrs. max.) (2)
C. Nitrogen Oxide (NO_x)			
Emission	No direct standard for emissions	0.70 lb/10^6 BTU in	0.70 lb/10^6 BTU in (3)
Ground Level Concentrations	0.15 PPM (1 hr. max.)	100 ug/m^3(annual arith.mean) (4)	0.108 PPM (1 hr. max.) 5.13 ug/m^3 (annual max.)

NOTES:

(1) Values reported are based on minimum and maximum coal sulfur content - 75% conversion of sulfur to SO_2 expected.
(2) Values reported are based on maximum coal sulfur content - 75% conversion of sulfur to SO_2 expected.
(3) Values guaranteed by boiler manufacturer - expected to be lower due to overfire air installation.
(4) National Secondary Standard.

Table 6

Taken from Southwest Energy Study, Air Pollution Aspects.

Existing and/or Proposed State Ambient Air Quality Standards

State	Particulate (ug/m^3)	Sulfur Oxides (ug/m^3)	Nitrogen Oxides
Arizona$^{(1)}$	70 AGM* 100 24-hr max	50 AAM** 250 24-hr max 850 1-hr max	None
Colorado $^{(1)}$	45 AAM 150 24-hr max	10 AAM 55 24-hr max 300 1-hr max	None
Nevada $^{(1)}$ (State wide)	60 AGM 150 24-hr max	60 AAM 260 24-hr max 1300 3-hr max	100 AAM
New Mexico$^{(1)}$	60 AGM	60 AAM	100 AAM
	90 3-day avg 150 24-hr max	260 24-hr max	200 24-hr max
Utah$^{(1)}$	90 AGM	Same as Federal	Same as Federal
Wyoming$^{(2)}$	60 AGM 150 24-hr max	60 AAM 200 24-hr max 1300 3-hr max	100 AAM

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(1) Existing standards

(2) Proposed standards

* Annual geometric mean

** Annual arithmetic mean

Table 7

Particulate standards

Given the design efficiency of the electrostatic precipitators (99.33%), Jim Bridger will easily comply with all relevant ambient and emission standards for particulate matter. This was not contested during the draft review process.

Oxides of Nitrogen (NO_x) standards

Regarding NO_x, Pacific Power & Light Company states:

> "We are pleased to report that emissions of oxides of nitrogen (NO_x) from the Jim Bridger boilers with 'overfire air ports' were recently guaranteed by the manufacturer not to exceed 0.70 lbs. per million BTU heat input, which is the EPA 'Standard for New Stationary Souces'.
>
> "The addition of 'overfire air ports' allows the Jim Bridger boilers to operate with an extended combustion zone in the furnace, which lowers the peak flame temperatures because of low excess air in the initial combustion zone, thus reducing the production of NO_x. Recent tests conducted by the boiler manufacturer indicate that significant NO_x reductions have been obtained using the 'overfire air' concept.
>
> "The State of Wyoming has no direct emission standards for NO_x, but instead applies the general ground level concentration standard of 0.15 ppm maximum (1-hour average). Comparing this standard to the maximum of 0.12 ppm (1-hour average) for NO_x calculated by our consultant Dr. Faith (who did not consider the use of 'overfire air' in his calculations), the existing Wyoming standards for NO_x ground level concentrations will not be exceeded. In addition, it should be noted that the calculated annual mean emissions of NO_x are below the national secondary standard by a factor of 20, even without the use of 'overfire air'."

In addition, according to the Companies' consultant, the apparent conflict between the Companies' data and the independent TVA prediction (Appendices A and B respectively) can be explained by pointing out that different assumptions were used. The Companies' consultant contends that if the TVA model had allowed for the aerodynamic lift exhibited by winds over bluffs near the plant, the one high hourly NO_x concentration during a coning situation would be about the same as the 0.12 ppm estimated in the company report.

For plume models other than the coning situation, the consultant offers the following:

> "The TVA report also shows hourly ground-level concentrations for two other plume models, i.e., inversion breakup and trapping plume. Of course, as indicated in the meteorological portion of the report, these fumigation conditions are not expected to be frequent in the vicinity of the Jim Bridger plant site. The calculated values, which for NO_x range as high as o.24 ppm for one hour, probably are about 25 percent high because differences in terrain elevation were used in the model. Considerations of aerodynamic uplift reduces the maximum hourly value to about 0.18 ppm for 1 hour, still above the Wyoming standard. However, Mr. Loren Crow's calculations (see his letter of August 17, 1971 to S. L. Campagna) indicate fumigation events are shorter than one hour in duration (typically 30-minutes) and have a frequency of less than one percent of the time. The Wyoming regulations allow 0.15 ppm NO_x (as NO_2) to be exceeded one percent of the hours in any 3-month period. However, with use of a corrected maximum value of 0.18 ppm for a fumigation condition, and a maximum concentration of 0.12 ppm for the coning plume, the Wyoming standard can be met without the one-percent exclusion."

The guarantees offered by the boiler manufacturer and the provision of "overfire airports" in the boiler design coupled with topographic and meteorological conditions at the site indicate NO_x standards will be met.

Sulphur Dioxide (SO_2) Standards

Most of the controversy in the draft responses centered around this substance. Regarding whether or not Jim Bridger SO_2 emissions will exceed air quality standards, the Sierra Club's and the EPA's comments are particularly pertinent. EPA's letter, dated Feb. 14, 1972, gives as a basis for calling for SO_2 removal equipment, ". . . the maximum expected SO_2 emissions shown on page 34 of the draft statement would exceed EPA's new source performance standards." As explained in the draft, the predicted SO_2 emissions were based on all of the sulphur in the coal being converted to SO_2.

Later data presented by the Companies (in Table 6) uses a factor of 75% sulphur conversion to SO_2. This has been generally corroborated by air quality experts at the Denver office of the EPA.[1/] They estimate an 80% conversion factor, at the highest. However, it should be noted that other estimates of conversion rates include 75%[2/], 90% (qualified as being conservative) [3/] and 95% [4/] [5/].

While using 75% of total sulphur instead of 100% as was previously done brings the emissions within the standards, Table 6 indicates the close tolerance between the emissions expected with maximum sulphur coal and the EPA New Source standard (1.17 lbs. vs. 1.20 lbs.). If the conversion factor exceeds 75% by much, then the standard may not be met when higher sulphur coal is used. In a letter dated March 17, 1972, the Company states:

> "It should be emphasized that with the coal to be mined in the initial years of the plant, SO_2 emissions will be below the standard, even assuming 100% conversion of sulfur to SO_2, through about the year 1990. With the expected 75% conversion, the plant will meet the present SO_2 emission standards without SO_2 removal equipment while burning coal of maximum sulfur content.
>
> "If for some reason unknown at this time, it becomes necessary to lower the SO_2 emissions while burning the higher sulfur coal, this can be accomplished by blending this coal with a coal having a lower sulfur content."

The Sierra Club's technical expert, Michael D. Williams of the John Muir Institute, cites extrapolations of the 1-hour TVA data to indicate a 24-hour concentration exceeding or barely meeting the standards. This is not supported by estimates made by EPA's meteorologist.[6/] Also, in

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[1/] Personal conversation with Fred Longenberger, Sr. Technical Adviser, EPA, Denver.

[2/] Southwest Energy Study, Appendix J, Report of the Coal Resources Work Group, p. 27.

[3/] Bureau of Reclamation, Final Environmental Impact Statement, Navajo Project, Feb. 4, 1972, p.38a.

[4/] Southwest Energy Study, Appendix A, Air Pollution Aspects, p.16.

[5/] Sierra Club comments

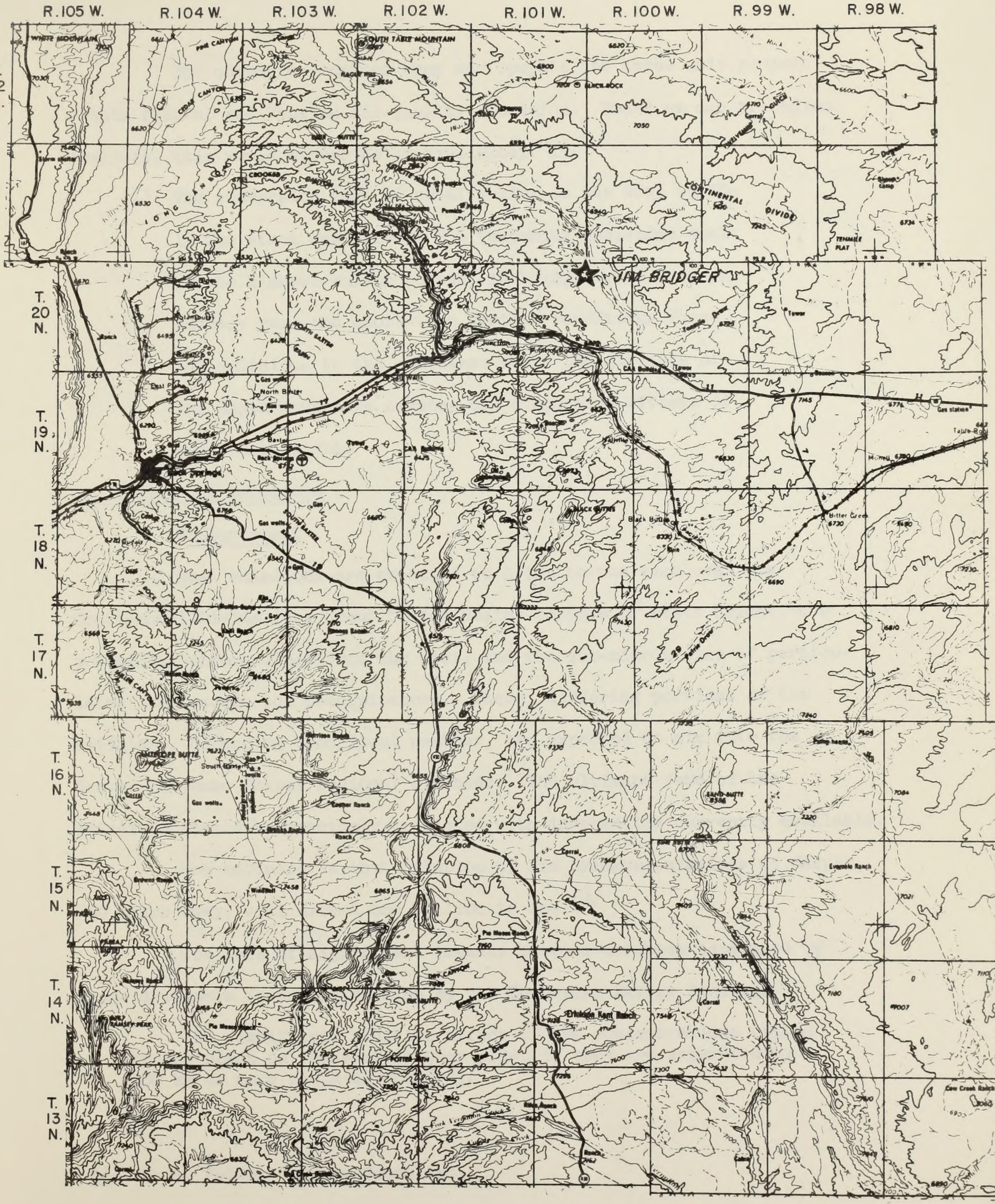
[6/] Personal conversation with Donald Henderson, Regional Meteorologist, EPA, Denver.

responding to a related point, the Companies' consultant states,

> "Williams writes that calculations of a one-hour ground-level concentration of 0.33 ppm SO_2 by use of a trapping model implies a 24-hour concentration of 0.08 ppm. This extrapolation is far from being correct. Trapping conditions are too short-lived to yield such results."

In addition to varying conversion rate estimates and problems associated with extrapolating data, another question has been raised regarding topography. The Air Resources Environmental Laboratory, National Oceanic and Atmospheric Administration (NOAA) pointed out the lack of sufficient meteorological data and a detailed topographic map in the draft. The probability of mountains or bluffs negating the benefits of high stacks was brought out in Southwest Energy Study research conducted by NOAA.

The general locations of significant terrain changes can be seen on map No. 4, following. In all quadrants east of the plant, the terrain does not exceed the stack height. A revised and expanded summary meteorological report is included in Appendix B. This indicates the extent of various weather regimes and directions of air flows. Due to prevailing winds, the east quandrants are expected to receive all but a minor amount of the emissions. As the NOAA comments point out, however, there is a potential for exceeding the draft's estimated SO_2 concentrations by a factor of 3 on the slopes of the Aspen Mountains should a ground based inversion persist and the emissions flow toward the southwest. The estimates from the Southwest Energy Study gives some reason to believe that air quality standards will be exceeded should an extended period of emission flow to the southwest occur. It is expected that these particular conditions will not occur often nor will they persist for a significant period of time when they occur. See Appendix A, page 5.



Topographic Features Surrounding Jim Bridger Plant

(Contour Interval 200 Feet)

MAP #4

The companies contend they can operate the three unit project within federal and Wyoming air quality standards. Based on our preceding analysis, this would appear to be true except if:

(1) The conversion rate of total sulfur in the coal to SO_2 in the stack gas exceeds 75% (assuming unblended coal of the highest sulfur content is being burned), and/or

(2) Certain rare and short-term weather conditions force the emissions to the southwest where the altitude of the Aspen Mountains negates the dispersion effects of the stack height.

c. Effects of emissions

Disbursement

Most emissions are expected to drift to the east over the Continental Divide (the Great Divide Basin) because of stack height, the prevailing strong winds from the west, and the sub-micron size of particulates that escape the precipitators. There, differing portions of the emissions, depending upon local weather, are expected to mix into the Denver-Cheyenne-Casper regional airsheds. The ultimate fate of the emissions cannot be precisely predicted with information currently available.

One estimate is that dilution of Jim Bridger emissions at Casper, 150 miles away, will exceed one billion to one.[6A]

The lack of significant impacts between airsheds separated by large distances is supported also by the Southwest Energy findings.

> "No significant additive effect of the concentrations caused by one plant on those of another plant if they are separated by 100 km or more could be found."[7]

[6A] W. L. Faith, Company Consultant.

Jim Bridger emissions may add to other emissions resulting from combustion in the Denver - Casper area, but the dilution effects offered by distance will make the addition very slight. No particular impact on air quality planning in these air regions is expected.

Effects upon visibility and aesthetics

One consequence of releasing stack gas emissions from fossil fuel combustion into the atmosphere is to reduce visibility and aesthetic quality. The following information included in the Interior Department Environmental statement for the Huntington Canyon (Utah Power & Light) plant would have general application to the Jim Bridger plant:

> "'The First Annual Report of the Council on Environmental Quality'2/ comments on visibility effects of air pollution to this effect:
>
> ". . . Particulates, however, are the major villain in reducing visibility. Particles (ash, carbon, dust, and liquid particles) discharged directly to the air scatter and absorb light, reducing the contrast between objects and their backgrounds. Particles are also formed in the atmosphere by photochemical reactions and by the conversion of sulfur dioxide to sulfuric acid mist. Wherever sulfur pollution is significant -- which is wherever large amounts of coal and oil are burned -- visibility diminishes as relative humidity rises.
>
> "The DHEW publication 'Air Quality Criteria for Particulate Matter,' 5/ states under the conditions set forth in the studies referenced therein that: '. . . With a typical rural concentration, such as 30 ug/m^3, the visibility is about 25 miles; for common urban concentrations, such as 100 ug/m^3 and 200 ug/m^3, the visibility would be 7.5 miles and 3.75 miles, respectively.'
>
> "With respect to sulfur dioxide concentrations, the DHEW publication 'Air Quality Criteria for Sulfur Oxides' states that 'Visibility reduction to about 5 miles was observed at 285 ug/m^3 (0.10 p.p.m.). However, this does not appear to be a typical case . . ."

7/ Bureau of Reclamation, Final Environmental Impact Statement, Navajo Project, p. 53a.

There is new information indicating SO_2 and NO_x play an important role in decreasing visibility through chemical conversion from the gaseous state to sulfate and nitrate particles. The companies consultant claimed this was unsupported theory and rejected the idea. Information from the Southwest Energy Study indicates that chemical conversion does occur and will have an impact on visibility:

> "1a. A review of available information on conversion of SO_2 and NO_x to particulate matter in plumes indicates that there is no information on conversion of NO_x to nitrate and the information on conversion of SO_2 is not very reliable and is in quantitive disagreement. However, it is clear from chemical analysis of collected particulate matter that SO_2 and NO_x are converted to particulate sulfate and nitrate.
>
> "If there is significant conversion of SO_2 and NO_x to particulates this will predominate over fly ash in causing visibility reductions."
>
> "Aircraft studies in power plant plumes have reported that as much as 50% of the gaseous SO_2 disappears (presumably to particulate sulfate or sulfuric acid) within ¼ mile of the stack exit."[8]

---

[8] Southwest Energy Study, Report of the Air Pollution Work Sub-Group, Appendix F 12/22/71

On page 59 of its Final Environmental Impact Statement for the Navajo plant, the Bureau of Reclamation mentions chemical conversion as a possibility, but draws no conclusions.

No precise conclusions can be drawn concerning the emissions impact on visibility. It was reported that the Air Resources Laboratory of NOAA, in its report to the Southwest Energy Study, concluded

> . . . "The Colorado River Basin is famed for its visibility, but the plants will cut down on visibility locally. 'The effect will be primarily local, being particularly severe along the higher terrain near the plant. Plants located in canyons will cause a marked degradation of visibility' up to a distance of about half oa mile 'within the confines of the canyon walls,' it said. When a short-lived 'fumigation condition' occurs -- that is, when the smoke is heavier than the air -- visibility can be reduced up to a distance of about 6 miles, it said." [9]

Local lowering of visibility near the plant can be expected for Jim Bridger. Relatively flat terrain with no narrow valleys or canyons will mitigate this impact.

Effects Upon Rangeland Ecosystem

Unfortunately, little is known about the effects of power plant emissions on the ecology of rangeland. A check with University of Wyoming sources revealed no research has been conducted on ecological effects of the Naughton Steam Electric Plant near Kemmerer, Wyoming or the Dave Johnston Plant near Casper, Wyoming.

Given the known effects of the components of power plant emissions on human health and on domestic crops, [10] the chance for damage to the rangeland ecosystem cannot be dismissed.

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[9] Western Resources Wrap-Up, Series VIII, No. 13.

[10] See for example "The First Annual Report of the Council on Environmental Quality" and DHEW's Air Quality Criteria for sulfur oxides, and particularly the Southwest Energy Study. Appendix F. Report of the Biota Work Group.

The Final Environmental Impact Statement for the Navajo Project states:

> "The DHEW publication, 'Air Quality Criteria for Sulfur Oxides,'[7] reports with respect to sulfur dioxides:
>
> "Adverse effects on vegetation were observed at an annual mean of 85 ug/m^3 (0.03 p.p.m.)."
>
> "The University of Utah is conducting fumigation trials of the effect of SO_2 on vegetation indigenous to the Colorado Plateau. The Forest Service has worked closely with the University and reports that the trials are not yet to the point where conclusive results are obtainable. The fumigation trials have involved some 60 species of plants native to the area, most of which were not sensitive below concentrations of one part per million. However, mountain mahogany, globe mallow, and Indian rice grass have shown symptoms of injury during the fumigation trials. Mountain mahogany does not grow in profusion near the plant. However, Indian rice grass and globe mallow are commonly found plants near the generating station and surrounding area.
>
> "Quoting from the hearings of the Utah Air Conservation Committee,[8] Harris M. Benedict, an employee of Stanford Research Institute, testified:
>
> "There have been many studies conducted on the effects of sulfur dioxide on plants. Some of these are field observations and some are carefully controlled laboratory fumigation studies. These studies have generally suggested that leaves of sensitive plants, such as alfalfa and white pine, may develop markings after eight hours' exposure to .24 to .30 p.p.m. Probably the most inclusive and most thorough of such studies involving field and laboratory results are the investigations of Thomas, O'Gara, Hill, and coworkers conducted right here in Utah. As a result of these studies, some 100 species of plants were ranked according to their sensitivity to sulfur dioxide. The most sensitive plant found, alfalfa, was then use in highly refined studies to determine the time of exposure required at various concentrations to mark the leaves and to reduce or interfere with photosynthesis. The results showed that unless the leaves were marked, no permanent effects on the growth of the plant occurred, although during the exposure itself the rate of photosynthesis might be reduced. However, the photosynthetic rate quickly returned to normal when the exposure to sulfur dioxide was stopped, unless some of the leaf tissue was killed.
>
> "The results of these numerous experiments have received world-wide acceptance and have generally been corroborated by Dr. Morris Katz (Ind. & Eng. Chem. 41:2450-2465)."

The Southwest Energy Study recommends control of emmisions at a point significantly less than the SO_2 and NO_x standards presently in existance because of the concern for the effects of this emmision on flora and fauna.[10] This impact is unquantifiable at this time because the research data on rangeland ecosystems are not in. In general, impacts are expected to (1) decrease with distance from the plant, (2) occur over a long period of time and (3) affect individual plant and animal species, but not to cause widespread disruption at the community level.

Another effect of atmospheric aerosols (suspended particulates or other matter) is to reflect sunlight, thus reducing the amount of insolation that reaches the earth. Concerned scientists are stating that man-caused aerosols which are continously being released into the atmosphere, added to those from natural sources such as volcanoes, are beginning to have sufficient cumulative effect that they have caused a slight lowering of average global temperatures. They speculate that a fourfold increase would trigger an ice age.[11] Concern is also being expressed that particulates may "seed" storms and alter weather patterns, generally downwind from urban areas or other large source of atmospheric contaminants.

The carbon dioxide produced from all fossil fuel combustion has been accumulating in the atmosphere and in the seas. The total amount of CO_2 in the atmosphere has increased at least 10% since 1890. The amount released by the Jim Bridger plant will add a small increment in the global total. Atmospheric CO_2 causes a "greenhouse" or warming effect upon global climate. A projection of present global exponential increases in fossil fuel combustion would cause a further increase of 20-25% in atmospheric CO_2 by the year 2000.[12]

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[10] Southwest Energy Study, Appendix F, Report of the Biota Work Group, April, 1972, page 30.

[11] S. I. Rasool and S. H. Schneider, Atmospheric Carbon Dioxide and Aerosols: Effects of Large Increases on Global Climate. Science, July 1971.

A related question mentioned in the draft responses concerns weather modification through moisture added to the air by cooling towers. In the Southwest Energy Study NOAA concluded "There is only a slight potential for weather modification effects from cooling towers." [13]

d. Trace Elements

The following tables 3C, 3D, and 3E from the Southwest Energy Study [14] give a comparison of trace elements contents from various power plants. The report narrative states on p. 25:

> "A review of the published reports on the minor or trace element content of coals, cited at the end of this report, clearly indicates that none of the coals reported on here contain significantly abnormal amounts of any of the known critical trace elements."

It also warns against drawing conclusions about emissions from the tables:

> "The percentages of other coal components that are volatilized or otherwise released to the atmosphere from the power plants can only be determined very indirectly by calculation of the excess amounts of these components in the raw coal over the amounts in the combined fly ash and bottom ash, generally 75 and 25 percent, respectively. Such calculated differences should be considered as very approximate measures of effluent"

And later:

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[12] B. Bolin, The Carbon Cycle, Scientific American, Sept. 1970. Also Mass. Inst. of Tech., Man's Impact Upon The Global Environment - A Study of Critical Environmental Problems, August 1970.

[13] Western Resources Wrap-Up Series VIII, No. 13

[14] Southwest Energy Study Appendix J, Report of the Coal Resources Work Group.

> "Thus, the need for the warning on possible misuse of data is substantiated. Only by direct capture and analysis of stack gas and escaping particles, by detailed measurements of dispersal patterns, and by a carefully planned soil-analysis program can reliable data on possible contamination by unburned or reconstituted coal components be obtained."

The Final Impact Statement, Navajo Project discusses mercury as follows:

> "The Navajo Generating Station operating at full capacity (Three Units) will consume a maximum of 23,000 tons of coal per day while producing 2300 megawatts. The actual flue gas mercury concentration will range from 1.3 parts per billion to 2.0 parts per billion. This is based on an analysis of the mercury in the coal which ranges from 0.02 to 0.07 parts per million and burns with a 10% ash residue having approximately the same mercury concentration and a flue gas weight of 0.055 No./ft.^{3} @250 degrees F (total daily volume 11,376 million cubic feet).
>
> "The total amount of mercury discharged annually at the higher value (0.07 ppm) if deposited on an air shed approximately 43 miles square (1800 square miles), would equal average annual fallout of mercury in Sweden (0.5 grams per acre). For comparison, the recorded level of mercury found in the atmosphere in the vicinity of Ord Mine, Mazatzal Mt:, Arizona, is 16 parts per billion."

And the Companies' consultant adds:

> "EPA has recently suggested (40CFR Part 6) an ambient air average 30-day concentration of one microgram per cubic meter (lug/m3) of mercury as sufficient to protect the public health from illness due to inhalation of mercury and has permitted mercury ore processing facilities, and mercury cell chlor-alkali plants to emit 5 lbs. per hour of mercury. The allowance is based on a highly conservative atmospheric dispersion model and ground-level emissions. If Jim Bridger were allowed to emit 5 lbs. per hour, the coal could contain 375 ppb mercury under the same assumptions. So the margin of safety is tremendous.
>
> "As to radionuclides it is well known that nearly all soils and minerals exhibit natural radio-activity. The ash in coal is no exception, and that which finds its way to the atmosphere carries its radionuclides with it. Eisenbud estimates that a 1000 MW coal-burning power plant without dust collection equipment would discharge annually about 350 mcuries ^{228}Ra and 550 mcuries of ^{226}Ra. With 99.33%-efficient dust collection equipment at Jim Bridger this would be reduced to 3.5 and 5.5 mcuries respectively, insignificant amounts."

No information on fluorine conversion rates were found during the preparation period of this statement. At 130 ppm, flourine may be significant,

TABLE 3C.--COAL ANALYSES; NINE TRACE ELEMENTS IN WHOLE COAL TO BE USED AT PLANNED POWER PLANTS.

[All analyses in percent or parts per million of whole coal; value followed by L indicates less than value given; EU, equivalent uranium (eU).]

SOUTHWEST ENERGY STUDY USGS'71

SAMPLE	ASH %	AS PPM	F PPM	HG PPM	SB PPM	SE PPM	TE PPM	TL PPM	EU PPM	U PPM
					SAN JUAN, NEW MEXICO					
D153392C	15.40	1.	220.	0.02	0.27	1.50	0.02	0.20L	10.L	1.40
D153393C	17.10	1.	120.	0.01	0.44	2.80	0.02L	0.20L	10.L	1.70
					NAVAJO, ARIZONA					
D153348C	9.52	3.	90.	0.02	0.19	1.70	0.02L	0.20L	10.L	0.68
D153349C	8.52	3.	90.	0.03	0.15	1.40	0.02	0.20L	10.L	0.77
					KAIPAROWITS, UTAH					
D152224C	5.92	1.	140.	0.05	0.09	1.60	0.02	0.20L	10.L	0.31
D152225C	5.56	1.	150.	0.05	0.09	1.90	0.02L	0.20L	10.L	0.40
D152226C	4.28	1.	100.	0.03	0.05	1.60	0.02L	0.20L	10.L	0.48
					HUNTINGTON CANYON, UTAH					
D152227C	7.60	1.L	140.	0.02	0.05	1.50	0.02L	0.20L	10.L	0.44
D152228C	4.10	1.L	150.	0.02	0.31	1.40	0.02	0.20L	10.L	0.14
D152229C	7.64	1.L	130.	0.03	0.58	1.90	0.02L	0.20L	10.L	0.42
D152230C	7.14	1.L	130.	0.01	0.07	2.10	0.02	0.20L	10.L	0.69
D152231C	6.20	1.L	110.	0.02	0.26	1.40	0.02L	0.20L	10.L	0.23
D152232C	4.94	1.L	110.	0.02	0.05L	1.30	0.02L	0.20L	10.L	0.12
D152233C	8.68	1.L	130.	0.01L	0.27	1.80	0.02L	0.20L	10.L	0.93
D152234C	9.36	1.L	130.	0.01L	0.77	1.80	0.02L	0.20L	10.L	0.80
D152235C	8.44	1.L	160.	0.03	0.20	2.20	0.02L	0.20L	10.L	1.00
					JIM BRIDGER, WYOMING					
D152573C	9.72	1.	130.	0.05	0.49	1.50	0.02L	0.20	10.L	1.30

TABLE 3D.--COAL ANALYSES; FOUR TRACE ELEMENTS IN COAL ASH, AND TOTAL NITROGEN AND TOTAL SULFUR IN COAL TO BE USED AT PLANNED POWER PLANTS.

[Value followed by L indicates less than value given; 0.0 B, no analysis.]

SOUTHWEST ENERGY STUDY USGS'71

SAMPLE	ASH %	CD PPM	CU PPM	LI PPM	ZN PPM	TOT N %	TOT S %
				SAN JUAN, NEW MEXICO			
D153392C	15.40	0.50L	62.	139.	54.	1.30	0.81
D153393C	17.10	0.50L	67.	152.	33.	1.20	0.77
				NAVAJO, ARIZONA			
D153348C	9.52	1.00L	54.	48.	48.	1.00	0.34
D153349C	8.52	1.00L	54.	58.	64.	1.00	0.35
				KAIPAROWITS, UTAH			
D152224C	5.92	0.50	72.	87.	40.	1.00	0.51
D152225C	5.56	0.50L	72.	53.	42.	1.00	0.48
D152226C	4.28	0.50	88.	45.	24.	0.0 B	0.43
				HUNTINGTON CANYON, UTAH			
D152227C	7.60	1.00L	56.	33.	16.	0.0 B	0.27
D152228C	4.10	1.00L	106.	58.	26.	0.0 B	0.39
D152229C	7.64	1.00L	60.	60.	13.	1.30	0.31
D152230C	7.14	1.00L	98.	116.	19.	0.0 B	0.36
D152231C	6.20	1.00L	64.	36.	26.	0.0 B	0.36
D152232C	4.94	1.00L	87.	43.	26.	0.0 B	0.39
D152233C	8.63	1.00L	80.	200.	17.	0.0 B	0.61
D152234C	9.36	1.00L	67.	160.	24.	0.0 B	0.48
D152235C	8.44	1.00L	75.	204.	35.	0.0 B	0.66
				JIM BRIDGER, WYOMING			
D152573C	9.72	1.00L	102.	128.	23.	1.20	0.44

TABLE 3E.--COAL ANALYSES; 22 TRACE ELEMENTS IN COAL ASH (SEMIQUANTITATIVE SPECTROGRAPHIC ANALYSIS), PLANNED POWER PLANTS.
[0.N, not detected; value followed by L indicates less than value given.]

SOUTHWEST ENERGY STUDY USGS'71

SAMPLE	ASH %	TI %	MN PPM	B PPM	BA PPM	BE PPM	CE PPM	CO PPM	CR PPM	GA PPM
				SAN JUAN, NEW MEXICO						
D153392C	15.40	0.50	700.	700.	2000.	2.	0.N	10.	20.	50.
D153393C	17.10	0.70	300.	700.	1500.	3.	0.N	10.	30.	50.
				NAVAJO, ARIZONA						
D153348C	9.52	0.30	150.	150.	3000.	0.N	0.N	10.	50.	30.
D153349C	8.52	0.30	150.	150.	5000.	0.N	0.N	10.	70.	50.
				KAIPAROWITS, UTAH						
D152224C	5.92	0.30	150.	2000.	300.	0.N	0.N	10.	70.	20.
D152225C	5.56	0.30	500.	2000.	150.	0.N	0.N	7.	50.	30.
D152226C	4.28	0.50	100.	700.	5000.	2.	0.N	7.	70.	30.
				HUNTINGTON CANYON, UTAH						
D152227C	7.60	0.20	70.	1500.	200.	0.N	300.L	7.L	50.	10.
D152228C	4.10	0.30	70.	3000.	700.	0.N	300.L	15.	70.	15.
D152229C	7.64	0.30	30.	2000.	200.	0.N	300.L	7.L	50.	10.
D152230C	7.14	0.70	70.	2000.	300.	0.N	300.L	7.	70.	30.
D152231C	6.20	0.20	150.	2000.	300.	0.N	0.N	7.	50.	15.
D152232C	4.94	0.30	150.	3000.	300.	0.N	300.L	10.	70.	15.
D152233C	8.68	0.50	50.	1500.	500.	0.N	300.L	10.	70.	30.
D152234C	9.36	0.70	70.	1500.	300.	2.L	300.L	10.	70.	30.
D152235C	8.44	0.70	50.	1500.	300.	2.L	300.L	7.	70.	15.
				JIM BRIDGER, WYOMING						
D152573C	9.72	0.50	100.	1500.	3000.	3.	300.	7.	70.	30.

TABLE 3-E (CONTINUED)

SOUTHWEST ENERGY STUDY USGS'71

SAMPLE	GE PPM	LA PPM	MO PPM	NB PPM	ND PPM	NI PPM	PB PPM	SC PPM	SR PPM	V PPM
SAN JUAN, NEW MEXICO										
D153392C	0.N	70.	7.	20.	0.N	10.	50.	15.	500.	100.
D153393C	0.N	70.	7.L	20.	0.N	10.L	70.	15.	200.	150.
NAVAJO, ARIZONA										
D153348C	0.N	70.	7.L	20.L	0.N	20.	30.	10.	3000.	70.
D153349C	0.N	70.	7.	20.L	0.N	30.	50.	15.	5000.	100.
KAIPAROWITS, UTAH										
D152224C	0.N	70.	7.L	20.L	0.N	30.	30.	15.	500.	70.
D152225C	0.N	0.N	7.L	20.L	0.N	20.	30.	10.	300.	70.
D152226C	0.N	0.N	7.	20.L	0.N	30.	50.	15.	1000.	150.
HUNTINGTON CANYON, UTAH										
D152227C	0.N	0.N	0.N	20.L	0.N	10.	30.	10.L	700.	50.
D152228C	0.N	70.	7.	20.L	150.L	50.	30.	15.	1000.	70.
D152229C	0.N	0.N	0.N	20.L	0.N	10.	30.	10.L	700.	50.
D152230C	0.N	70.	7.	20.L	150.L	15.	30.	15.	1000.	100.
D152231C	0.N	0.N	7.L	20.L	0.N	15.	30.	10.L	1500.	70.
D152232C	0.N	70.	7.L	20.L	0.N	20.	30.	15.	1500.	70.
D152233C	0.N	70.	7.	20.L	150.L	15.	50.	20.	1000.	150.
D152234C	0.N	70.	7.L	20.L	150.L	15.	30.	15.	1000.	150.
D152235C	0.N	70.	7.L	20.L	70.L	20.	50.	15.	1500.	100.
JIM BRIDGER, WYOMING										
D152573C	0.N	70.	15.	20.L	150.L	15.	30.	15.	700.	100.

TABLE 3-E (CONTINUED)

SOUTHWEST ENERGY STUDY USGS'71

SAMPLE	Y PPM	YB PPM	ZR PPM	
				SAN JUAN, NEW MEXICO
D153392C	50.	3.	200.	
D153393C	50.	5.	300.	
				NAVAJO, ARIZONA
D153348C	30.	2.	150.	
D153349C	30.	3.	150.	
				KAIPAROWITS, UTAH
D152224C	30.	3.	150.	
D152225C	20.	2.	150.	
D152226C	30.	3.	150.	
				HUNTINGTON CANYON, UTAH
D152227C	20.L	2.	150.	
D152228C	30.	3.	150.	
D152229C	20.	2.	300.	
D152230C	30.	3.	300.	
D152231C	20.	2.L	150.	
D152232C	30.	3.	200.	
D152233C	30.	3.	200.	
D152234C	30.	3.	200.	
D152235C	30.	3.	150.	
				JIM BRIDGER, WYOMING
D152573C	30.	3.	150.	

but the analysis presented in Table 3C does not indicate Jim Bridger coal is particularly high compared to others. However, Appendix F of the Southwest Energy Study clearly indicates the dangers associated with this compound. Monitoring for fluorine buildup in vegetation is clearly required.

The Southwest Energy Study reported on research that compared the trace element content of vegetation over a 10-year period. The results confirm a buildup of trace elements, but find it is local in extent. Quoting from the report:

> "The trace metal content of plants in San Juan County was found to be low in 1961-62, and the effluent from the power station has raised the content to above normal levels only in the immediate vicinity of the station."
>
> "Apparently a change in water availability or perhaps certain elements or components in the fly ash has stimulated certain species of Atroplex that normally form a mat about 3 inches in height to grow luxuriently into large succulent shrubs 1 to 2 miles west of the power station."
>
> "Wind blown power plant effluent being deposited 1 to 2 miles west of the Four Corners Power Station contain about the same or lower concentrations of most trace elements than fly ash collected from the power station stacks. Only mercury and fluorine are significantly higher in the wind-blown material. The effect of trace elements in the effluent on soil drops off rapidly with distance . . ." "Barium, stontium, beryllium and lead are the most widespread of the trace elements."
>
> "The increased trace elements in the soils and vegetation of San Juan County between 1961 and 1971 indicate in addition to an enrichment of elements required by plant life the possibility of a buildup of potentially harmful elements. This possibility should be monitored . . ." 15/

15/ Southwest Energy Study, Report of the Coal Resources Work Group, Appendix J-III, pages 1, 3, & 43.

It follows that the Jim Bridger project will cause a buildup of trace elements in the soil and vegetation near the plant. Some of the elements may prove to be harmful. The ecological inventory being conducted by the University of Wyoming should measure background concentrations of trace elements. Once the base-line measurements are made, the ecological monitoring system should include provisions for measuring buildup of trace elements over time.

e. Emission Control Design and Guarantees

The question has been raised, "Will there be guarantees on the efficiency of the controlling installations?" In light of the performance record of electrostatic precipitators in other plants using low sulfur coal, this issue is particularly pertinent.

Manufacturer's guarantees are important, but adequate design planning is probably more critical.

Extensive laboratory analyses of the coal to be burnt were conducted in the United States and Australia, a country with considerable experience with low sulfur coal. After reaching agreement that electrostatic precipitators were the best equipment to remove particulates, 30,000 tons of Jim Bridger coal were shipped to the Dave Johnston power plant for testing through a pilot precipitator. The results of the precipitator testing program were used in sizing the precipitator collection area and to determine efficiencies. The company reports:

> "The results of the pilot testing indicated that ash from Jim Bridger coals can be successfully collected in this type of electrostatic precipitator and that, to obtain the desired efficiency, a specific collecting area (SCA) of 487.5 square feet per 1000 cubic feet per minute of flue gas flow will be required, making it one of the largest fly ash precipitators in the world.

> "In addition, the precipitator casing contains sufficient unfilled space to allow the SCA to be increased by 20%. Evaluation and application of all the technical information developed by the various testing programs not only defined the design parameters of the Jim Bridger precipitators, but also produced technical assurance that these essential pieces of pollution abatement equipment will perform continuously at those levels necessary to protect the Jim Bridger Plant environment.
>
> "The precipitator supplier is required to demonstrate through testing over a period of 6,000 hours of on-load operation that the precipitators will meet, and continue to meet, the efficiencies prescribed without having to perform adjustments, modifications or additions, but if the precipitators do not meet guaranteed efficiencies as described in the foregoing, the guarantees under the Agreement require the supplier to install the additional collecting sections in the existing casing and, further, to add yet more precipitator capacity, including casing as necessary to meet guarantees."

The combination of effective design planning and performance testing contractual arrangements indicates the companies have made a solid effort to obtain the proper equipment that will function according to design capacities.

The companies' monitoring efforts are discussed in a later section. The State of Wyoming, working with the EPA, will be responsible for monitoring ambient air quality. The responsibility for enforcing air quality statutes also rests with the State of Wyoming and EPA.

f. Company Plans to Maintain Air Quality

Some of the selected equipment was discussed previously but the following company data helps complete the picture:

> "The chimney height has been established as 500 feet. Calculations and studies have indicated that this height will result in ground level concentrations of particulates, oxides of nitrogen and SO_2 well within the State of Wyoming and Environmental Protection Agency standards for air quality.
>
> "A contract for furnishing and installing electrostatic precipitators for the three units has been awarded to the joint venture of the Swedish firm A. B. Svenska Flaktfabriken and Carborundum Company, an American firm. This manufacturer was selected from a limited list of bidders who have demonstrated proven success with operating electrostatic precipitators collecting ash from low-sulfur coal. The

> Jim Bridger precipitators are guaranteed to remove 99.33% of the particulate matter and will operate without conditioning agents and be installed on the "cold side" of the air preheater. These precipitators will be among the largest in the world, having a specific collection area (SCA) of 487.5 square feet of collecting plate area per 1,000 cubic feet per second of flue gas."

The NO_x production aspects of the boilers was previously described. To reiterate, the manufacturer guarantees less NO_x than the new source standards allow.

The companies do not intend to include SO_2 removal equipment at this time, but they will allow physical space for the equipment if it becomes necessary. One objection to this proposal was based on the assumption that air quality standards may be exceeded. In addition to the previous discussions, the companies view is:

> "Our Engineers, Bechtel Corporation of San Francisco, have estimated that their experience indicates a 70% conversion of sulfur to SO_2. Thus, we conclude that the actual SO_2 emission rate will meet the SO_2 emission standards while burning the highest sulfur content coal without resorting to SO_2 removal equipment.
>
> "The Owners recognize their responsibilities towards environmental protection and have taken positive action towards meeting Federal environmental criteria. One of these positive actions is the inclusion in the design, provisions for the future addition of SO_2 removal equipment. These provisions will provide for the ready addition of scrubbers or other sulfur removal equipment, should conditions warrant their need, without the attendant problems associated with a retrofit. Other positive actions include the installation of supplementary NO_x control equipment and installation of electrostatic precipitators guaranteed to not only meet, but exceed the collection efficiency required to achieve the particulate emission standards."

The problem of SO_2 removal equipment was thoroughly analyzed in the Mojave Final Impact Statement. 16/

> "The Committee found that no process has been developed and proven commercially in an operating powerplant. 'Commercially proven' is defined as the operation of one of these systems for sulfur removal from stack gases in a plant of at least 100 mw for at least 6 months with satisfactory operation.

16/ Bureau of Reclamation, Final Environmental Impact Statement, Feb. 1972

"Dr. Sherwood has stated he expects some of these schemes to be successful, and that within 10 years there will be a number of competing processes.

"In view of the state-of-the-art of SO_2 removal from flue gas, as summarized above, the participatns have decided to sponsor a research program, rather than wait until a suitable commercial process is developed. They hope to accelerate the application of a suitable process for the Navajo Generating Station by actively joining in the development work.

"Phase I of this program has been completed.[2] It consisted of a 60-day study by Bechtel engineers and consultants, principally: Doctors G. S. C. Wang, J. L. Shapiro, E. Lundquist, and T. K. Sherwood; and Messrs. G. Gideon and I. Raben.

"The goal of this Phase I study was to determine the detailed approach that would help develop a technically and economically feasible SO_2 removal process for inclusion in the Navajo Generating Station design. Special attention was given to the aspect of burning low-sulfur coal at the Navajo Generating Station. While this is an aspect which has received relatively little treatment thus far, it will clearly be of widespread interest in the future, as well as being of immediate interest to those fortunate enough to have access to low-sulfur coal.

"During Phase I a number of alternatives were considered, ranging from those on the threshold of feasibility to advanced processes. The programs studied were also varied--from building a demonstration-size unit at a currently operational powerplant to performing bench-type experiments. The possible benefits of participating directly in research and development programs of other groups were also investigated.

"As a result of the Phase I Study, a recommendation was made by Bechtel Corporation that a series of experiments on a pilot-plant scale be undertaken to determine what type of equipment is necessary to achieve high efficiency SO_2 removal from low-sulfur coal, and what the optimum design and operating parameters would be.[12] It is hoped that this information may be combined with the operating experiences of others on so-called large demonstration-size plants so that the Navajo Generating Station equipment can be designed using the data obtained from these experiments. At the same time, the experiments will be sufficiently general and carefully documented to be of use to others using similar coal fuel. This recommendation was accepted, and the design planning and construction for the pilot-size tests have been completed. The pilot plant was installed at the Mohave generating station and the testing is underway.

> "In all of these, the emphasis will be on maximizing the information return for SO_2 removal, using low-sulfur coal, within the time framework of Navajo Generating Station applicability.
>
> "The participants have committed themselves to installing SO_2 removal systems on all three units at the Navajo Generating Station. The participants have also announced as their goal the installation of an SO_2 removal system on the first generating unit at the Navajo Generating Station in time for its initial date of commercial operation. The participants report, however, that they will have to assess the results of the research program, which is scheduled for completion in March of 1972, before they can positively determine whether an SO_2 removal system can be developed prior to the date of commercial operation of the first unit. It should be noted that during the first year of operation, only one unit will be operating and hence a maximum of 70 tons per day of SO_2 will be emitted. At this level of emission of SO_2, State and Federal ambient air standards will not be exceeded even without SO_2 removal. It is planned than an SO_2 removal system will be installed and operative before the commercial operating date of Unit 2 which is May 1975, one year after the commercial operating date of Unit 1."

Although the results are not known as of this writing, the Navajo experiment project should guide decisions on SO_2 removal equipment at Jim Bridger.

2. Generating Plant Impacts Other Than Emissions

a. Construction Materials--The plant will require sand and gravel in large quantities. The only source of quality material is the bench land adjacent to the Green River. Removing and transporting the material will have a low impact, but it is important that conservation practices be employed because of the proximity to the river.

Surfacing material to hold down the dust at the construction site is readily available nearby; 100,000 cubic yards of scoria, a cinder-like material, have been used to date. This construction material was removed from the area proposed for strip mining.

b. Water Quality--A project of this magnitude offers two major threats to water quality. One occurs during the construction period when a large surface area is subject to erosion and the other involves disposal of liquid wastes.

Erosion and subsequent deposition of silt particles in live streams impact water quality by limiting its usability for irrigation, fisheries, etc. The impact of plant construction (including the railroad and access road) is deemed to be low both in magnitude and importance. This conclusion is reached after considering the plant's location eight miles from the nearest live stream, the low annual rainfall and the availability of conservation practices to control erosion during high intensity storms. The plant location away from live water also reduces the likelihood of pollution from a malfunction of the sewage system serving the complex.

The closed cooling system proposed, wherby all water is either dissipated into the atmosphere or is recycled, would seem to preclude the possibility of surface water pollution from large quantities of water used in the cooling process.

The disposal of blowdown water highly charged with minerals by the process of cleaning the condensing mechanism offers a more serious threat to surface water quality. This liquid effluent has the potential for killing aquatic life and surface vegetation. It could, if allowed to run off, reach the Green River and in time the Flaming Gorge Reservoir. The Companies propose to bury the blowdown residue in the strip mine. This material is expected to be highly charged with salts. A second material, less hazardous, but in a much larger quantity, is the fly and bottom ash removed from the plant. This, too, will be buried in the strip mine.

The following tables display the chemical composition of Jim Bridger Coal, fly ash and the fly ash size distribution. Trace elements were considered in a preceeding section of this report.

"1. Coal Analyses

Proximate	% by Weight As Received	Ultimate	% by Weight As Received	Sulfur Forms	As Received
Moisture	20.39	Moisture	20.39	Pyritic	0.15
Ash	8.62	Carbon	55.40	Sulfate	0.02
Volatile	29.55	Hydrogen	3.46	Oranic(Diff)	0.36
Fixed Carbon	41.44	Nitrogen	0.90	Total Sulfur	0.53
		Chlorine	0.00		
		Sulfur	0.53		
		Ash	8.62		
		Oxygen(by Diff)	10.70		

"II. Fly Ash Chemical Composition

	% by Weight
S_1O_2	62.2
Al_2O_3	18.8
Fe_2O_3	4.7
CaO	7.3
MgO	2.2
Na_2O	1.0
K_2O	0.7
T_1O_2	1.5
P_2O_5	0.16
SO_3	0.77
Undetermined	0.67

"III. Fly Ash Size Distribution

During the pilot precipitator tests that were conducted at the Dave Johnston Plant while firing Jim Bridger coal in Unit #1, laboratory particle size distribution, surface chemical analyses and bulk chemical analyses of three fly ash samples of the collected fly ash were conducted by Southern Research Institute of Birmingham, Alabama. A copy of their report dated December 17, 1971, is enclosed for your use.

"Fly ash distribution size is undoubtely influenced by the pulverization equipment and the combustion process. Since the furnace equipment at Jim Bridger will be of a different manufacture than that at Dave Johnston, we can expect some difference in fly ash distribution when burning the same coal at Jim Bridger."

The graph on the following page gives the size ranges of one sample.

The University of Wyoming, Plant Science Division, has successfully grown wheat in laboratory tests using pure fly ash from Jim Bridger coal instead of soil. They have hypothesized that fly ash may be useful in neutralizing small spots of acidic overburden if it is found at the Jim Bridger mine.

Returning to the question of ground water pollution, BLM, after consulting with the U. S. Geological Survey in Cheyenne and BLM geologists, concludes that:

1. Leaching caused by moisture to the surface is not likely due to arid conditions

2. Neither the Fort Union nor Lance formations will rapidly transmit leachates to ground water (USGS estimates 10 feet of movement per year).

3. Ground water will not be materially affected by burying the plant's residues in the strip mine.

The Companies' plans for monitoring future surface and ground water are discussed in Chapter VI, Section D, of this report.

c. Atmosphere--The prevailing westerly winds can pick up dust particles from surfaces disturbed during construction, from uncovered tailings or from dried cooling and combustion process residues. The addition of particulates from these sources to the ambient air was judged to be of low magnitude. When considered as an addition to the adverse impact of the stack emissions, it gained somewhat in importance.

d. Land Use--Because of the site's low grazing capacity, changes in land use from grazing to industrial are insignificant at the 500-acre plant site. The plant will generate significant changes in residential and commerical land use at four locations -- the Point of Rocks

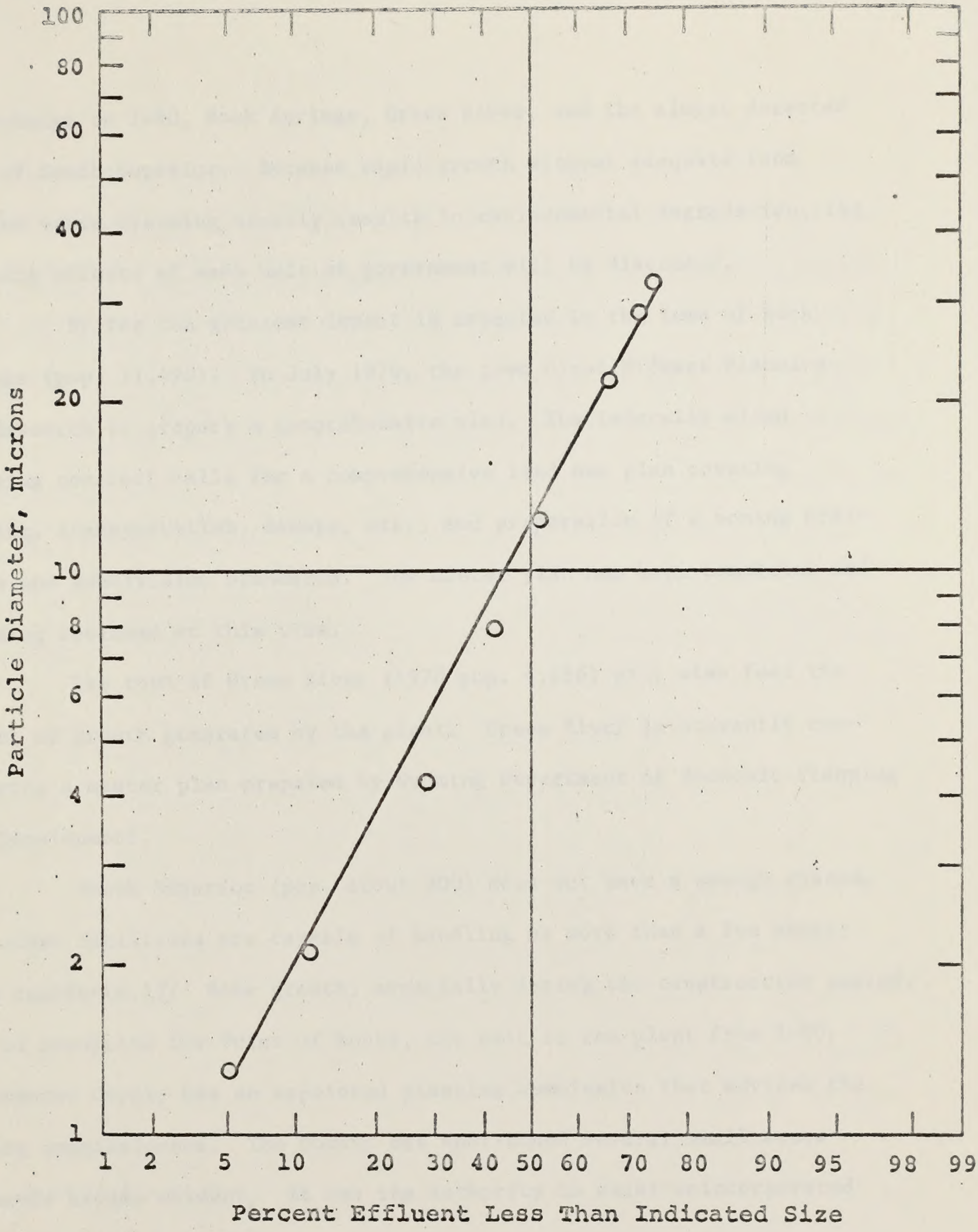

Figure 1. Pacific Power and Light Sample 1

interchange on I-80, Rock Springs, Green River, and the almost deserted town of South Superior. Because rapid growth without adequate land use and other planning usually results in environmental degradation, the planning efforts of each unit of government will be discussed.

By far the greatest impact is expected in the town of Rock Springs (pop. 11,490). In July 1970, the town hired Midwest Planning and Research to prepare a comprehensive plan. The federally aided planning contract calls for a comprehensive land use plan covering housing, transportation, sewage, etc., and preparation of a zoning ordinance and subdivision standards. The master plan has been completed and is being reviewed at this time.

The town of Green River (1970 pop. 4,196) will also feel the impact of growth generated by the plant. Green River is presently considering a master plan prepared by Wyoming Department of Economic Planning and Development.

South Superior (pop. about 200) does not have a sewage system. Its other facilities are capable of handling no more than a few short-term residents.17/ Some growth, especially during the construction period, can be predicted for Point of Rocks, the exit to the plant from I-80. Sweetwater County has an appointed planning commission that advises the county commissioners. The County has spot-zoned several small areas as needs became evident. It has the authority to asist unincorporated towns with planning and zoning.

17/ See Idaho Power Co. and Pacific Power & Light Co. Environmental Impact Study Report Supplement No. 2, July 1971 (letter of May 13, 1970).

The major impact will be on housing, transportation, and schools. All sources indicate some problems in accommodating the construction forces; the permanent work force can be absorbed without too much difficulty. The next three pages, taken from the Rock Springs master plan, indicate the growth expected and the following table graphically portrays the expected construction force buildup:

GROWTH TRENDS AND CHARACTERISTICS OF THE POPULATION

As a population grows, there are normally trends and characteristics of that particular population that surface. A thorough analysis of these trends and characteristics will normally determine the implications, if indeed there are any, to the planning process.

This part of study deals only with the determining of those implications for the physical planning of Rock Springs. They are dealt with individually in greater depth and detail elsewhere in this study.

It should be pointed out, in the case of Rock Springs, that any trends and characteristics that have surfaced in the past may not be of any help in showing future characteristics. For instance, if population growth trends are projected from the last several decades, growth would be shown, at the end of this study period, at a virtually static population. The consultant feels that a new basis for population analysis based on probable employment will be more valid than projecting future characteristics on the basis of past trends.

There are some obvious implications confronting the physical planning of the City of Rock Springs. The school system is going to be put under tremendous pressure to meet the demands of the population. The school situation is rather unique in that this magnitude of impaction is usually government oriented and federal funds are available to alleviate the problems faced by the local school system. The jobs in the area are assured, and this presents a burgeoning task for the developers, homebuilders, etc. to furnish housing needs for these workers and their families.

This brings us finally to the city, and the financial problems they will be facing. Nearly all the development and building of plants is actually going on in the county, and that is where the tax evaluation is going to be. However, the demand for housing and municipal services is going to be in the city. This is expensive, for increases in personal property taxes will not pay for the increase in service demands, i.e. fire protection, police protection, street department.

One of the important features of the study will be on the income and expenditures of the city and will go into greater detail on the subject.

SELECTED CHARACTERISTICS OF POPULATION FORECAST

As the population of Rock Springs expands from its current level to that projected for this study period, the city will witness a change in the characteristics of its population. The 1950 and the 1960 census showed the median age for Rock Springs going up. In 1950, it was 30.5 and in 1960 it was 31.8. The 1970 median age figure is not yet available from the Census Bureau, but age group categories indicate it will probably fall between 29 and 30. This is the start of a new trend that the consultants feel will take place in the ensuing years, that is, a lowering of the median age and an increase in the persons per household. And while the 1970 census data shows a decrease in the persons per household, (that figure is now 2.84.) the consultants believe this to be the end of that trend. The persons per household figure, has in fact increased even within the 14 months since the census was taken. This is borne out by the approximate 80 new units in the south section of town, constructed since the census, where the 1970 census persons per household figure was 4.3.

This trend reversal and the employment information from Cameron Engineers, Pacific Power and Light, etc. has indicated that population characteristics should be based on the new jobs rather than past trends.

While these jobs will attract their share of the single construction workers, they will also attract the younger families with more children. Thus, the consultant has used a 2.95 persons per household factor in all projections; this figure represents a substantial increase from the current (1970 Census) 2.84 family size, but is considerable below the national average.

POPULATION CHARACTERISTICS: 1960

Total Population	10,371	
Percent Increase 1950-1960	-4.5%	
Total Male Population	5,273	50.84%
Total Female Population	5,098	49.16%
Percent Non-White	1.7%	
Percent Under 18 Years	35.3%	
Percent 18-64 Years	55.0%	
Percent 65 Years and Over	9.8%	
Fertility Ratio*	456	
Population in Group Quarters	35	0.3%
Number of Households	3,391	
Percent Increase in Households 1950-1960	1.9%	
Population per Household	3.05	

*Children under 5 years per 1,000 - Women 15-49 years

SOURCE: U.S. Census of Population, 1960

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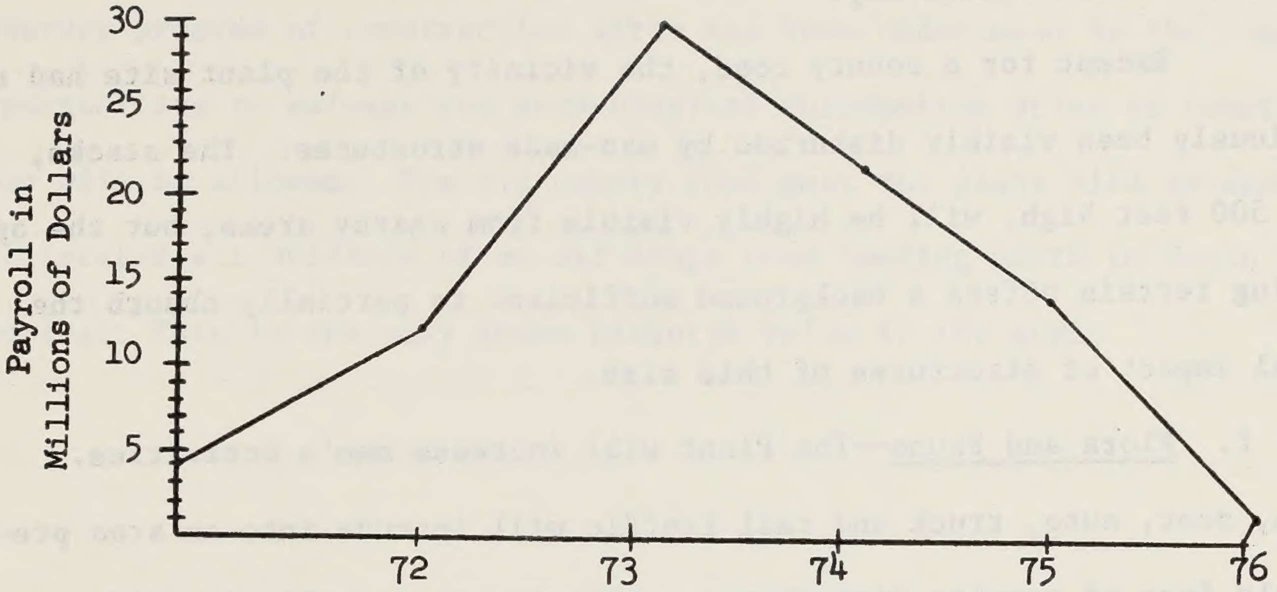
PROJECTED POPULATION CHARACTERISTICS

1975	Factor Family Size			
Total Pupulation		15,404		
Total Dwelling Units			5,221	
Pre-School	(.36)	1,880		
Kindergarten	(.07)	365		
Elementary	(.38)	1,984		
Junior High	(.17)	888		
Senior HIgh	(.16)	835		
Total Enrollment				4,072
Working Age	(1.60)	8,356		
Retired (Over 65)	(.21)	1,096		
	(2.95)			

1980				
Total Population		18,452		
Total Dwelling Units			6,255	
Pre-School	(.36)	2,252		
Kindergarten	(.07)	438		
Elementary	(.38)	2,377		
Junior High	(.17)	1,063		
Senior High	(.16)	1,000		
Total Enrollment				4,878
Working Age	(1.60)	10,008		
Retired (Over 65)	(.21)	1,314		
	(2.95)			



Construction "Boom" as Indicated by Payroll[18]

Land is available for mobile home parks to accommodate the construction crews. Several are now under construction in or near Rock Springs. This will continue a present trend that has seen the number of mobile homes in Sweetwater County more than double in the 1960-1970 decade.[19] With proper planning and zoning, land can be obtained from the public domain managed by the Bureau of Land Management for residential and commerical uses.

With a construction peak in 1973-1974 and planning only partially complete, moderate adverse impacts on land use and population density can be predicted.

e. Scenic Views and Vistas and Wilderness - Open Space Qualities--The top of the Plant's smoke stacks, a 230 KV tap line, the railroad and the access road will to some degree be visible to about 18,000 travelers on I-80 each summer day.

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[18] See Idaho Power Co. and Pacific Power & Light Co. Environmental Impact Study Report Supplement No. 2, July 1971.

[19] Information obtained from Wyoming Department of Economic Planning and Development.

Except for a county road, the vicinity of the plant site had not previously been visibly disturbed by man-made structures. The stacks, some 500 feet high, will be highly visible from nearby areas, but the open, rolling terrain offers a background sufficient to partially absorb the visual impact of structures of this size.

f. Flora and Fauna--The Plant will increase man's activities. Noise, dust, auto, truck and rail traffic will intrude into an area previously free of regular disturbance. Allowing a one-half mile wide zone of disturbance alongside the railroad and access road, and allowing 640 acres for the plant, about 4500 acres will be affected. Bureau of Land Management wildlife biologists estimate fewer than 100 sage grouse and an occasional antelope would be displaced. Apparently, the Wyoming Game and Fish Commission disagree. They state:

> "During the period just prior to December 14, 1971, which is considered a severe winter, over 1,200 antelope were actually counted in this area. The estimate of our district Big Game Biologist places the winter population for the area at approximately 2,000 head. His estimate for a mild winter is that 600 to 800 head of antelope winter in this area."

Without knowing how large an area they are considering, precise definition of numbers is impossible. The Plant, road, and railroad will have a more significant impact during severe winters like 1971-1972. However, no significant reduction in total antelope numbers in the area is expected.

g. Archeological and Historic Values--Additional cultural factors include the potential effects on historic and archeological values. Through a contract with the University of Wyoming Department of Archeology, a survey program of construction sites has been undertaken by the Companies. Opportunities to salvage any archeological information prior to construction will be allowed. The old county road past the plant site evidently obliterated all evidence of an old stage road leading north to South Pass, Wyoming. This is the only known historic value in the area.

B. TRANSMISSION LINES

The impact of transmission line construction and operation relates to the linear corridor affected. Adverse impacts can be reduced by intensive route analysis on specific locations. Since the earliest proposals, land managing agency objections have resulted in significant relocations of portions of the route, as discussed in Chapter VI, "Measures Taken to Enhance, Protect or Mitigate Impacts."

Definitive impacts on certain portions of the proposed transmission lines are unclear at present because of survey status. One such segment is the 345 kv. line from Goshen to Kinport as shown on Exhibit 1. Status of this segment is unknown. We have received no communication from the Fort Hall Tribal Council or BIA with regard to specific problems or impacts.

All lines are under evaluation to determine routes and design specifications which would be most environmentally desirable. The power companies have been cooperative and responsive to suggestions in this regard. Alternative routes which were identified through analysis after publication of the draft statement, or through comments on the draft statement, are identified and discussed in Chapter X, "Alternatives to the Proposal."

1. Soil Erosion and Deposition

Adverse impacts of soil erosion and deposition have been identified with regard to the road and trail system required to construct and maintain the approximately 750 linear miles of power lines. Removal of natural vegetation and modification of landscape tend to concentrate natural runoff in the roadway, thereby accelerating erosion. While these soils do not typically have a high productivity in the agricultural sense, serious erosion represents a permanent loss of the resource base. Present and future generations would lose the potential of the affected site for grazing, wildlife habitat, recreation and efficient function of the hydrologic cycle.

The importance of this impact is rated moderate. Adverse effects can be reduced by implementing comprehensive erosion prevention and site rehabilitation measures during all stages of road system planning, construction and operation. Specific areas of high concern are:

a. Arid, erodible soils where revegetation is difficult (principally Wyoming).

b. Roads and trails crossing natural drainages (throughout entire route).

c. Construction and use of roads and trails in steep, broken topography (various sections west of Kemmerer through Idaho).

2. Flora and Fauna

Vegetation will be removed or disturbed on tower construction sites, roads and trails, and on certain R/W sections to achieve necessary clearance for lines.

Wildlife will be disturbed and temporarily displaced during periods of actual construction. Improved access to big game winter-use areas may be detrimental because of increased traffic disturbing the game populations (particularly, with reference to elk in their winter habitat). Harassment of game by snow machine users may occur. Proposed transmission lines traverse approximately 75 miles of big game winter habitat area. Seasonal closure of key areas may be necessary if undue harassment does take place.

Counteracting this adverse impact is the beneficial effect of vegetative change in forested areas from the standpoint of big game habitat. Clearing of a timber overstory will generally result in increases of shrubs, forbs and grasses which are highly desirable for wildlife forage. It will also increase the "edge effect" - available browse, with timber nearby for cover. Impacts such as that of traffic on big game must be monitored and resolved if they occur.

The crossing of the Seedskadee Wildlife Refuge caused some concern even though the Game Refuge Manager was on record in the draft as not objecting to the route. The reason for not by-passing the refuge to the south was because trona plant emissions cause corrosion and buildup of noninsulating material on insulators. This should not be a particularly important factor once the plants complete their compliance program to meet air quality standards. However, unless real impacts on the refuge can be shown, moving the line south and thus making it longer does not appear warranted.

3. Land Use

The right-of-way for the transmission line will encompass approximately 14,000 acres. It will restrict other space-occupying uses such as buildings, etc., on this acreage, but traditional uses such as grazing domestic livestock and wildlife can continue on all but the fraction of the right-of-way needed for towers and roads. A small amount of agricultural land, in relation to the total land area within the right-of-way, is crossed. In Wyoming, the line crosses irrigated hay meadows and pastures in the valleys of Hams Fork River, Bear River and Meadow Creek. In Idaho, the single line crosses or skirts the edge of some dry land wheat farms from Montpelier to Goshen substation.

North of Georgetown, Idaho, the single 345 kv. line must cross a prominent ridge known as Georgetown Summit. Approximately four miles of line north of the summit involve resource-use conflicts and locational problems.

Three proposed routes have been evaluated. Two involve crossing of agricultural lands of the Idaho Department of Public Lands or private owners. The right-of-way would pose constraints on use of the land and objections have been voiced by the State of Idaho and private owners. Slight movement of the route eastward to Caribou National Forest lands would conflict with use of a group of ponds known as Swan Lakes. The U. S. Forest Service has recreational development planned for the Swan Lakes area. All tentative routes in this area are being evaluated to identify a location which is most environmentally desirable.

The two circuits from the Montpelier divergent point to the Borah substation cross 25 to 35 miles of agricultural land at four locations. The line is expected to have a moderate adverse impact on the agricultural land uses because of inconvenience to farming operations and the constraints the lines and towers would pose for sprinkler irrigation systems.

The originally proposed lines passed near the towns of Lava Hot Springs and Arimo, Idaho, and would possibly affect growth patterns. This factor and alternative routing is discussed in Chapter X, Alternatives to the Proposal. No other specific impact on residential-urban areas has been identified.

Industrial development along the route (primarily mineral development) will be beneficially affected by the increased availability of power.

Access to public lands along the route would be enhanced in those cases where the right-of-way roads are found to be suitable for public use.

4. Aesthetics

Adverse impacts by the power lines and associated roads on scenic views can be expected. Approximately 180 miles of prairie or rolling hills with long vistas will be affected in Wyoming and Idaho. The low-growing vegetation in these areas does not provide screening potential to reduce visual impacts.

West of Kemmerer, Wyoming, the lines traverse approximately 150 miles of valley-mountain areas which have significant inherent scenic value. Numerous transportation routes will be crossed by the lines and, in some cases, views of the traveling public will be adversely affected. The line crosses three major highway routes that carry traffic toward Yellowstone National Park. These are Wyoming State Highways 187 and 189 and U. S. Highway 30N. Average summer traffic loads on these routes are 880, 570 and 1090 cars per day, respectively.

In Idaho, two areas exhibit a high natural scenic quality because of the diversity of land form, vegetation and water. These are the Bear River area (appeoximately 80 miles), and the Blackfoot River area (approximately 30 miles) on the proposed routes. Proposed transmission lines and roads will degrade scenic and open space qualities.

Adverse impact on aesthetics are significant considering present land uses, the relative quality of scenery in the area, and the magnitude of this proposal.

5. Cultural factors

Historical and archeological sites and artifacts are common throughout the area. Preliminary studies conducted by the University of Wyoming and Idaho State University indicate there are no apparent archeological sites which will be destroyed or disturbed by the project. An archeological survey has been completed for public lands in Idaho. No sites of value were identified along the line route. Stipulations for public lands will include provision for notifying proper authorities and arranging for salvage if archeological sites are encountered.

6. Inductive coupling

There may be danger of inductive coupling or direct fault between transmission lines and the signal of U. P. Railroad or other communication lines. The railroad location was placed on Exhibit 1 so the extent of potential conflict can be seen. The Companies report that they have established practices relating to communication facilities owned by others.

The usual procedure consists of contacting all the railroad and communication companies having facilities in the area where the transmission line is proposed. These entities are presented with a map showing the proposed route of the transmission line, noting the expected fault amperes. Those parties owning the communication facilities then determine whether they will suffer any detrimental affects and present their comments to the Companies. If it is found that a situation exists which could be harmful to the communication facilities, the problem is usually resolved by providing adequate protective devices in the communication circuits, or in some instances, the proposed transmission line is relocated. To the knowledge of the task force group, past instances of conflicts have been resolved by coordinated and satisfactory solution to the parties concerned.

7. Ozone

Ozone produced from transmission lines can have a significant human health effect, can seriously damage plant life, and is a prime indicator and component of photochemical smog. Pacific Power and Light Co. has reported that, "As indicated in the Environmental Protection Agency's letter, ozone production is a function of the design corona loss. For the Jim Bridger 345 kv lines, we have used a relatively large conductor to minimize losses, and therefore, have a relatively low corona level. This is achieved by utilizing a two-conductor bundle of 1272 MCM, ASCR, which has a calculated corona level of slightly less than 2.5 kw/mile when calculated in accordance with the 'EHV Transmission Line Reference Book'." In view of the above, ozone production from the Jim Bridger 345 kv lines is not likely to have any significant impact upon the environment.

C. WATER SUPPLY SYSTEM

1. Water Quality and Quantity

The companies have purchased the water rights to 30,000 acre feet of water per year which can be pumped out of the Green River below Fontenelle Reservoir. Withdrawal of this water may affect downstream water uses since the water being diverted will not be available to dilute downstream salt accumulations. Drawing on information in the Colorado River Basin studies biennial Progress Report No. 5, Quality of Water, published in January 1971, the Green River at Green River, Wyoming, is shown to have a long-term (1941 through 1968) average flow of 1.3 million acre feet per year. Dissolved solids at this point are about 307 parts per million. The Colorado River downstream at Hoover Dam has a projected average flow of 8.3 million acre feet in the future. Concentrations of dissolved solids at this point have averaged 700 PPM. On this basis, withdrawing 30,000 acre feet at Green River would have the effect of reducing average flows at Hoover Dam to 8.27 million acre feet and increasing salinity concentrations from 700 PPM to 701.4 PPM or about two-tenths of one percent.

One stream, Bitter Creek, enters the Green River between the water quality station at the town of Green River and the stream flow gaging station downstream from Bitter Creek. Lack of reliable historic stream data on Bitter Creek, the fact that this stream goes dry, or nearly so, during periods of low flow and the reported periodic dumping of sewage into Bitter Creek prevents firm calculation of changes in dissolved solid content in this stretch of Green River, caused by withdrawing 30,000 acre feet of water annually at the intake structure.

The Director, Wyoming Water Planning Program, expressed the following conclusions: "Calculations on the basis of average annual conditions indicate that the depletion of water will result in an unmeasurable increase in total dissolved solids in the Green River at Green River, Wyoming. Since the concentrating effect of the depletion will be less than one-tenth PPM, it is negligible and unmeasurable." The above information indicates a minor impact from the consumptive use of the water purchased by the companies on both the Upper Green and Colorado Rivers.

2. Soil and Erosion and Deposition

Pipeline and road construction will result in the removal of vegetative cover on a corridor approximately 50 feet wide and 42 miles long. About five miles of the pipeline traverse highly erodible soils of 20% or greater slope. Numerous side drainages are also crossed at nearly right angles. The erosion hazard is high during and following construction until a vegetative cover is reestablished. A leak or repture in the pipeline, although not at all likely, would cause serious washing and possible damage from deposition. The magnitude and importance of total impact is rated moderate to high because of (1) the 250 acres affected, (2) the presence of physical characteristics which tend to accelerate the erosion process, and (3) the difficulty anticipated in revegetation of disturbed areas because of low fertility soils and arid climate.

3. Flora and Fauna

Shrubs and Grass--Vegetation in the pipeline right-of-way construction corridor would be destroyed. Rehabilitation efforts plus natural healing may revegetate this area except for access and maintenance roads. The dam and impoundment at the surge pond site will inundate 80 acres which at present has a scant cover of shrubs and grass. The importance of this impact is rated low.

Aquatic Plants--Growth of aquatic plant life in the proposed surge pond could be beneficial to a fishery or to waterfowl populations. The beneficial impact is rated slight because the quality of the water and future uses for fisheries, etc., are unknown.

Other Animals--The surge pond would provide a permanent water supply beneficial to all wildlife in the area. The impact is rated high in importance because of the present lack of water supplies in the immediate area.

4. Scenic Views and Wilderness - Open Space Qualities

The proposed pumping plant and power supply line would be located in an area substantially developed and congested with man-made facilities which adversely affect aesthetics (railroad, highways, substations, powerlines, etc.).

The pipeline (to be buried) and associated roadway will adversely affect scenic quality. The 50-foot construction scar will span the entire 42 miles from Green River to the project site. Due to poor soils and arid climate, revegetation of disturbed areas will be slow unless intensive effort is directed to rehabilitation.

The area of highest scenic impact is the east face of White Mountain which is a moderately important scenic backdrop for the Green River--Rock Springs area. The mountain face and two mile scar resulting from construction would be visible to certain residents of the area and even more people using Interstate 80, U.S. 187, and several lesser highways. Because the scar would degrade this area within view of a large general public, the impact is rated high in importance.

The proposed surge pond will introduce an element of diversity into a landscape which is somewhat monotonous. The impact is rated a moderate benefit because of general improvement to existing landscape in the plant site area.

5. Other

Construction of the powerline, pumping plant, pipeline and surge pond will generate some temporary employment in the area. Permanent jobs and lasting effects on the economy will be minor. The beneficial impact of jobs created is partially offset by the demands a "construction boom" places on the existing public facilities and services, such as the area school systems. Long-term beneficial impact is rated slight in importance.

The 230 kv transmission line to service the pumping plant is of adequate capacity to serve additional power needs in the town of Green River. Pacific Power & Light Company has indicated that this line will be used to stabilize the present power supply.

The Bureau of Sport Fisheries and Wildlife have requested an opportunity to review the design of the intake structure prior to construction. This review is under the provisions of the Fish and Wildlife Coordination Act, and will be undertaken as soon as design information is received.

D. COAL MINE OPERATION

1. Soil Erosion and Deposition

The coal mining operation will disturb an average of about 125 acres of the surface annually. Haul roads will be three to seven miles long. Topsoil and overburden removed from the mined area will be susceptible to wind erosion from the time it is removed until vegetation is restored under the rehabilitation plan. The imposed Federal and State rehabilitation requirements (see Chapter VI C) should minimize the time period of soil vulnerability and reduce the erosion impact. Erosion will be confined to the site and to the haul roads, with wind deposition of large particles within 2-3 miles. Wind erosion will also add particulate matter to the ambient air which will drift much further.

2. Water

The Company developed a test mine at the Jim Bridger site as a pilot study for determining details of development and operation. Surface water accumulated in the pit (20-30 feet deep). Although not present in apparently large quantities, removal will be necessary for the coal mining operation. Disposal methods will depend on the water quality as it is encountered. Where the quality is adequate for irrigation it can be utilized in this manner. Where water quality precludes its use for other purposes, disposal in the evaporation ponds or return to the aquifer of origin would be the preferred course of action. One sample analysis, admittedly of questionable reliability, indicates sodium content would preclude its use for either irrigation purposes or fisheries.

3. Atmosphere

The primary impact of the mining operation will be on atmospheric quality. Soil disturbance from the mining operation and the haul roads are subject to the prevailing westerly high winds and will add a continuous source of dust to the air. Winds average 12 miles per hour year-round. "Strong winds of 20 to 40 mph with higher gusts will prevail for a few days. . ." 20/ In order to physically accommodate the heavy ore trucks, the haul roads will have to be surfaced, minimizing dust from this source. The mining operation is expected to have a low to moderate impact on the area's atmosphere.

4. Flora and fauna

A slight impact is expected on birds, wild animals and domestic livestock in the immediate area of mining activity. Short-term displacements will occur. Revegetation requirements provided for in Federal stipulations of Title 23, CFR, and/or State imposed reclamation standards for mined areas under the Wyoming Open Cut Land Reclamation Act (Chapter 192, Session Laws of Wyoming, 1969) should reduce detrimental impacts. A discussion of rehabilitation regulations and plans is presented in VI C.

5. Scenic views

During coal mining operations and pending reclamation of the area, the scenic value and the natural landscape of the site will be impacted. Over the life of the project about 5,000 acres will be disturbed. The mine area is not visible from great distances (generally less than a mile) and will have impact on the scenery of slight magnitude and importance.

6. Other

Economy--The area's economy is based primarily on mining, ranching and railroad services. The additional mine operation will not change cultural patterns of this area. It is expected that the mine operation

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20/ State Engineer's Office, Wyoming Water Planning Program Report No. 3, Water & Related Land Resources of the Green River Basin, Wyoming. September 1970.

will provide in excess of 100 additional permanent employees to the area. This is a moderate increase in relation to the size of the local labor force. It is of high importance because they will be permanent employees.

Interpretive-Educational--The type of coal mine operation and other plant facilities provide the opportunity for interpretive and educational tours for local residents and tourists.

E. CUMULATIVE IMPACTS

While a project of this size must be separated into components to facilitate analysis, this approach can result in missing potential total impacts. There is also the possibility of a synergistic effect developing from a combination of effects working together that would increase the total impacts.

All of the project components have a potential of causing soil erosion. The linear nature of the project -- 750 miles of transmission lines, 42 miles of pipeline, and seven miles of railroad and access road -- diffuse the impact over a broad area.

The cumulative impacts from flue emissions has been raised. With reference to synergistic effects between flue gas emissions and fugitive dust the Company's consultant offers the following explanation, "In high concentrations, sulfur dioxide and coal dust in intimate contact would potentiate the effects of each other. Contact between the two in the Jim Bridger area will be minimal because of the high level of the flue gas emission and the low-level emission of the fugitive coal dust. Any period of contact will be extremely short and deal only with very low concentrations of SO_2. No cumulative impact can be expected. Another possibility would be the addition of catalytic material from fugitive soil to the plume with subsequent enhanced oxidation of SO_2 to sulfuric acid. Again, however, the separation of fugitive dust and SO_2 by virtue of elevation of release, the difference in mixing potential, and relative low concentrations of SO_2 in the diluting plume make this possibility so remote as to be nil."

The following explanation is offered by the Company's Consultant in response to the possibility of synergistic effects, particularly of stack effluent with the cooling tower plume, raised by the Environmental Protection

Agency. "The difference in temperature and in elevation of release of the two plumes renders interaction unlikely. Just what the interaction would be if the two plumes did meet is moot. Heat of the flue gas plume would tend to evaporate any liquid moisture in the cooling tower plume. If water droplets in the one plume dissolved SO_2 in the other, oxidation of the SO_2 might be enhanced. But this is far-fetched. Most likely no interaction will occur and if it does the effect would be insignificant."

The Southwest Energy Study, Report of the Biota Work Group (page 22), identifies a possibility of a synergistic effect on vegetation when SO_2 and NO_2 are both present as pollutants. These gases are found together in coal fired power plant emissions. Injury to plants may occur at a much lower concentration in combination than would be found if either substance were present alone. The studies indicating this effect were conducted on whitepine, tobacco, and other irrigated crops dissimiliar to the vegetation around Jim Bridger.

No other significant cumulative impacts were identified.

F. ACCIDENTS AND CATASTROPHES

The strip mine would present the possibility of injury or death from vehicle or equipment accidents, from falling materials and unexpected slides within the strip areas, and from the use of explosives within the strip pits. If the public is invited to view the mining operation, injuries could occur from falls from overlook areas.

Transmission line or tower failure would pose a serious hazard in the right-of-way area. Records indicate the number of wild fires being caused from broken powerlines is very small; therefore, the threat from fire is not considered significant. The possibility of animals coming in contact with a broken line is also considered to be very remote. The primary possibility of human contact would occur where the lines cross the public roads. There are five highways crossed by the transmission system. Summer traffic is heavy on these highways with tourists going to and from Yellowstone Park. Past incidents of accident or death occurring from existing powerlines does not indicate that the proposed line would create any significant hazard. Due to the distance between transmission line conductors, there is little or no hazard to large birds perching on the towers or conductors. As illustrated by Figure 2 on the next page, the phase spacing is approximately 27 feet and minimum spacing of any conductor to the tower body or guy is 7 feet 10 inches. Spacing required for eagles with full wing spread is generally accepted to be less than 7 feet.

All proposed transmission lines would be a potential hazard to low flying aircraft which are in the vicinity. The principal area of

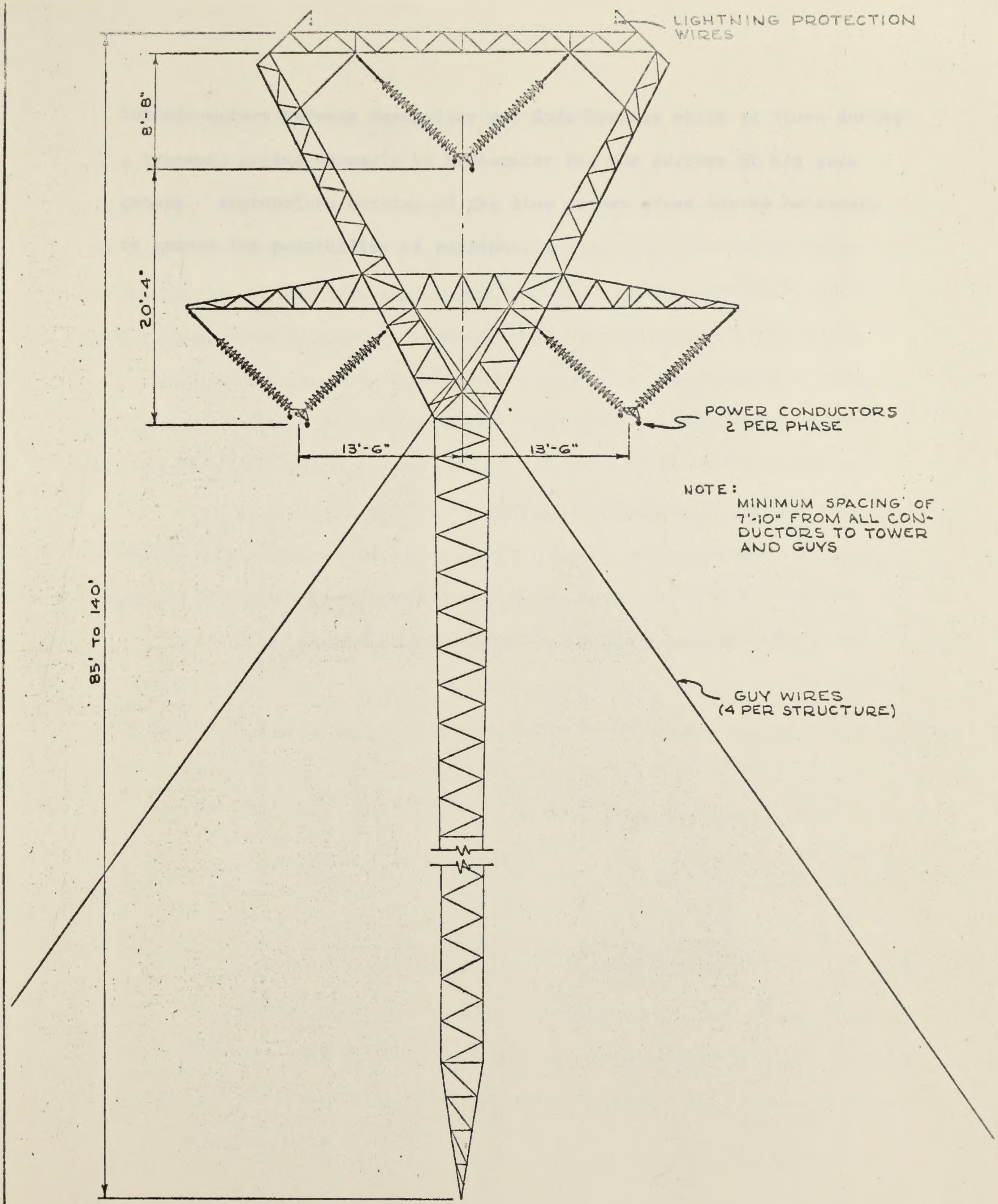
LIGHTNING PROTECTION WIRES
8'-8"
20'-4"
POWER CONDUCTORS 2 PER PHASE
13'-6"
13'-6"
NOTE: MINIMUM SPACING OF 7'-10" FROM ALL CONDUCTORS TO TOWER AND GUYS
85' TO 140'
GUY WIRES (4 PER STRUCTURE)

Figure 2

REVISION
ER | DATE | CH | APP | BY

ER
DATE MARCH 1, 1972
DES
DR G.K.R.
TR
CH
APPROVED
CHIEF DESIGN ENG.
HEAD OF ELEC. ENGRG.

JIM BRIDGER PROJECT
345 K.V. TRANSMISSION LINE
TYPICAL TANGENT TOWER

PACIFIC POWER & LIGHT COMPANY
PORTLAND, OREGON

SCALE NONE
SHEET 1 OF 1
PA-27802
REV. 0

concern occurs between Montpelier and Soda Springs which is flown during a two-week period annually by helicopter for the purpose of big game census. Appropriate marking of the line at key areas may be necessary to reduce the possibility of accident.

G. UNKNOWN AND PARTIALLY UNDERSTOOD IMPACTS

As noted in the comments from several sources, more information is needed relative to the effects of project operations on surface and ground water systems; depth of occurrence, water quality, direction and rate of movement of water bearing formations; and hydrologic effects of mining operations. Current plans by the Companies to mitigate potential adverse effects are outlined in VI D. Further study, however, may indicate the need for additional monitoring wells, gaging stations, etc. in line with the varying depth of water bearing formations and the direction and dip of geologic formations.

While predictions of the plant's emissions have been made and expected impacts discussed, much remains unknown. Monitoring the emissions and long term changes in the ecosystem is clearly called for,

H. ECONOMIC IMPACTS

The Jim Bridger Project is expected to generate considerable revenue to the State of Wyoming and to the local economy as a result of taxes, royalties and salaries. Anticipated employment of 200 people at the Plant and at the mine will create second generation income and employment by increasing demands on the service sector of the economy.

The annual payment by the Companies to the State of Wyoming on their water service contract for the three 500-megawatt units will be approximately $175,000 per year.

It is estimated that Wyoming State Sales and Use Taxes for equipment and materials purchased for the plant, mine, and transmission lines from 1971 through 1976 will total some $6,500,000.

Total property taxes on the Jim Bridger Project facilities, exclusive of coal production and severance taxes, and assuming continuation of the present millage levies and ratio of taxable value to construction cost, is estimated as follows:

Tax Year	Property Taxes
1972	$ 37,000
1973	490,000
1974	1,285,000
1975	3,000,000
1976	4,000,000
1977 and thereafter	5,000,000

Coal production and severance taxes to be paid to the State of Wyoming on all coal mined is estimated at approximately $400,000 per year during the early years of operation when the plant is expected to operate at a capacity factor of 85%.

Wyoming's share of royalties from coal mined on public sections will vary significantly from year to year, depending on whether coal is being mined on the Federal sections or on the U. P. Railroad sections. The Companies estimate that the Federal royalty payment will average approximately $500,000 per year during the first half of the 35-year period and approximately $350,000 per year over the lifetime of the power plant. The law provides that 37 1/2% of royalties paid to the Federal Government from coal mined on public lands are returned to the State of origin.

Because of the uncertainties involved with the construction force (i.e., family size, duration of stay, etc.), no attempt has been made to estimate the cost to be borne by the local government in providing the various services required by the employees and their families. It is probable that most of these services for the permanent work force can be absorbed by the existing infrastructure and that the increased population will be sufficient to justify needed improvements. Complete new facilities may be required in some instances.

VI

MEASURES TAKEN TO ENHANCE, PROTECT OR MITIGATE IMPACTS

VI. MEASURES TAKEN TO ENHANCE, PROTECT OR MITIGATE IMPACTS

A. TRANSMISSION LINE LOCATIONS

The initial right-of-way location involved numerous on-the-ground inspections with U.S. Forest Service, Bureau of Reclamation, Bureau of Sport Fisheries and Wildlife, U.S. Soil Conservation Service, Bureau of Indian Affairs, and Bureau of Land Management personnel. Progressing from the proposed plant site in a westerly direction, the following route changes or relocations were incorporated into the Companies' right-of-way request:

1. The Bureau of Land Management requested a right-of-way relocation 2½ miles to the south of the Companies' proposed Highway 187 crossing north of Rock Springs. This action would now place the crossing at the 14-Mile Hill area (14 miles north of Rock Springs). The proposed powerline crossing would utilize a natural cut or pass through the White Mountain Range, thereby eliminating any skylining problems that would otherwise be encountered anywhere within a 2 or 3 mile radius.

2. The Bureau of Sport Fisheries and Wildlife requested a right-of-way relocation several miles downstream of the Companies' proposed crossing of the Green River and Seedskadee National Wildlife Refuge. The crossing as originally proposed would have dissected a prime waterfowl habitat development area in the heart of the refuge, and interfered with wilderness qualities found upstream. The powerline crossing as now contemplated would cross immediately to the north of the Big Island bridge and would span the body of water at approximately the same height as the bridge superstructure. The proposed height of the powerline would not present a menace to waterfowl since the birds in flight would be rising to clear the very noticeable bridge structure. The proposed

crossing is also at a narrow point of the refuge which is not planned for waterfowl nesting developments. From the planned visitor overlook to be located on the eastern bluffs of the Green River overlooking Big Island, the transmission lines would not be visible, nor would they be visible from the proposed picnic and use areas to be situated on Big Island proper.

3. The U. S. Soil Conservation Service requested a route change from the Companies' originally proposed crossing of the Hams Fork River, north of Kemmerer, Wyoming. The Companies' original proposals would have dissected the proposed Upper Hams Fork Reservoir, a PL-566 project. The new alignment has been shifted 2 1/2 miles to the north which avoids the proposed dam site and high water line and still avoids direct impact with the existing Kemmerer and Viva Naughton Reservoirs. The reservoirs are nearby, but the lines will be out of sight from these heavily fished water bodies.

4. The Bureau of Land Management worked closely with the power companies in locating the transmission line corridor from the Hams Fork River to the townsite of Cokeville, Wyoming, to avoid paralleling or disturbing the historic Sublette Cutoff of the Oregon Trail and any associated historical sites. These historical sites include, but are not limited to, the Nancy Hill Grave and Emigrant Graves sites, Emigrant Spring and Rough Lock Hill. In addition, this geographical area receives moderately high recreational use at this time and has a potential for much greater use in the future. Proper right-of-way alignment in this region of the State is of the utmost importance and concern.

From Cokeville, Wyoming, the three 345-kv transmission lines enter Idaho and proceed to their point of divergence located northeast of Montpelier, Idaho.

5. The Bureau of Land Management recommended relocation of the point of divergence about one-quarter mile east and north of the orginally proposed site on top of a prominent ridge where the towers would have been visible from the town of Montpelier. The selected location is a valley depression shielded from view by surrounding ridges and hilltops.

6. The single 345 kv line running northward from the point of divergence to the Goshen substation must cross Montpelier Canyon and U. S. Highway 89 which connects Montpelier, Idaho and Afton, Wyoming. As originally proposed, the line corssed the canyon and U.S. Highway 89 from high point to high point on either side of the valley and would have been highly visible. The Bureau of Land Management recommended relocation of the line a quarter mile eastward so the route would cross through the low swales of the ridges on either side of the valley, eliminating the prominence of the structure and conductors.

7. North of Soda Springs the Goshen substation route as selected parallels a county road along the Blackfoot River. The county road utilizes portions of the historic Lander Trail. Portions of the Lander Trail over which the county road has not been constructed are clearly visible. In addition, this area has considerable recreational use with a potential for greater utilization. The route as originally proposed was incompatilbe with the scenic, historical and recreation values of the area. An alternative route through the low foothills and a long valley about 1 1/2 to 2 miles west of the originally selected route has been identified to eliminate conflict with the old Lander Trail. The Companies have agreed to this location.

This location, however, appears to conflict with scenic and recreational values further to the north after it crosses the Blackfoot River. This route is further described and evaluated in Chapter X, Alternatives to the Proposal.

8. The route of the two combined 345 kv circuits running westward from the point of divergence at Montpelier to the Kinport and Borah substations must cross the Cache National Forest.

Routes have been carefully evaluated to minimize potential adverse effects on National Forest lands, while coordinating with satisfactory route locations on adjacent lands. The route selected is approximately 1 1/2 miles south of the original proposal. It crosses the Forest boundary on the east side approximately 1/8 mile north of Morgan Canyon. From there it generally follows up the drainage through the head of the South Fork of North Canyon. It would cross the main Bear River range just south of Moonlight Meadow. From there it would span the North Fork or Main Canyon and continue down the Rocky Knoll Ridge. It would pass to the south of Bear Wallow and Thimbleberry Springs and be generally located on the north slope of the ridge to the west Forest boundary.

The area is located in Sections 7, 8, 9, 10, 11 and 14, T. 12 S., R. 42 E.; and Sections 1, 2, 3, and 12, T. 12 S., R. 41 E., Boise Meridian, in Franklin and Bear Lake Counties, Idaho.

9. The Companies are attempting to minimize adverse visual impacts of the transmission towers. Specially designed towers are being proposed in several instances to blend the towers into the landscape in the most pleasing manner possible. Helicopters will palce the towers and transport some other materials.

B. WATER PIPELINE AND SURGE POND LOCATION

One question posed by the Project concerned evaporation and beneficial use of the surge pond for fisheries, and protective measures to prevent loss of fishes through the intake structure and the pipeline. The Company plans for the water system are outlined below:

> "The surge pond surface area will be about 80 acres and the water will be essentially ambient temperature. It is calculated that about 300 acre feet of water will be evaporated per year depending on climatological conditions. The effect of this small amount of evaporation upon the environment will be negligible.
>
> "The surge pond will be stocked with fish to provide a limited sport fishery and will be made available to wildlife, provided such uses are compatible with the primary use of the pond. It may be necessary to treat the pond at certain times of the year for algae control by chlorination or application of copper sulfate. Method of application and concentration of chemicals would be carefully controlled so as not to render the water unfit for drinking by wildlife and to permit usage, if possible, of the surge pond for a sport fishery.
>
> "Designs for the protection of young fish at the pumping station on the Green River are being developed by the Owners' Engineer, Bechtel Corporation of San Francisco. These designs incorporate well established criteria for protection of fish at intake structure of this sort. The intake structure will be located immediately adjacent to the river to permit a sweeping flow past the pump intake, providing an easy and acceptable escape for fish that may come to the fish screens. Self cleaning, mechanical, link-belt screens will be employed to prevent fish from entering the pump intake wells. The recommended approach velocity to the screens is 0.5 ft./sec., and the screen size openings will be 0.14 or 0.25 inches. The exact mesh opening will be determined by special studies to be conducted shortly. These design considerations meet the recognized criteria for the protection of small fish. A spray system will be incorporated in the facility. The preliminary designs have been reviewed with the Wyoming Game & Fish Commission, and the final design will be submitted to them for approval before construction commences."

The Bureau of Sport Fisheries and Wildlife will review the design of the intake structure as soon as it is finalized under provisions of the Fish and Wildlife Coordination Act.

BLM feels that the considerations above provide ample protection and enhancement of fisheries values.

C. REVEGETATION OF SPOIL PILES AND OTHER DISTURBED AREAS

The Wyoming Legislature passed an "Open Cut Land Reclamation Act" in 1969. The law declares the following policy:

> "It is hereby declared to be the policy of this State to provide for the reclamation and conservation of land subjected to surface disturbance by open cut mining and thereby to preserve natural resources; to aid in the protection of wildlife and aquatic resources; to establish agricultural, recreational, home and industrial sites; to protect and perpetuate the taxable value of property; and to protect and promote the health, safety and general welfare of the people of this State."

The Rules and Regulations promulgated under the Act provide in Chapter II, Section 8 in part:

> "a. Definitions
> (1) New open cut mining is open cut mining which will create affected land.
> (2) Affected land is an area of land from which overburden shall have been removed, or upon which overburden or refuse shall have been deposited, or both, after May 23, 1969.
>
> "b. An operator must obtain a properly issued permit before engaging in new open cut mining.
>
> "f. Pits and quarries opened after May 23, 1969 which are under the supervision and control of any government agency whose regulations are equal to or greater than those imposed by Section 6 of the Act may be operated without obtaining a permit from the Commissioner.
> ..."

Chapter III of the Rules and Regulations covers reclamation requirements.

Chapter IV provides for an annual report by the operator which "shall clearly indicate the number of acres affected, the nature and depth of the overburden (peaks and ridges), grading carried out, details of any reseeding, estimation of the success of previous reseeding, the number of acres reclaimed and any other facts pertinent to the reclamation program."

Bonding requirements are covered in Chapter V of their rules and regulations. Chapter VI refers to submission and acceptance of the reclamation plan. The State law applies to public lands of all Government agencies unless the agency regulations are equal to or greater than the State law.

Tile 43CFR, Part 23 provides regulations similar to those under the Wyoming Open Cut Land Reclamation Act to "avoid, minimize, or correct damage to the environment - land, water, and air - and to avoid, minimize, or correct hazards to the public health and safety" where mining is authorized under the mineral leasing laws.

43 CFR-23 calls for (1) joint field examination by BLM and USGS, (2) identification of nonmineral values existent prior to mining and written notice of general requirements for their protection, (3) approval by USGS (only after consultation with BLM) of both exploration and mining plans submitted by applicant, and (4) a performance bond sufficient to satisfy reclamation requirements, but at least $2000.

Both Companies have provided this task force with copies of the requirements they impose on their contractors regarding restoration and protection of the natural environment. Review indicates these requirements are sufficient to provide for full compliance with Stipulation included in right-of-way grants. The Soil Conservation Service has prepared guidelines in the form of Technical Notes for the reclamation of surface mined areas in Wyoming. These guidelines are available to the Companies and the enforcement Agencies for their use in developing reclamation plans. In addition, the companies have contracted with the University of Wyoming for research studies on revegetation of the spoil piles at the mine. This is in effect an expansion of similar studies the University has been conducting at other locations in the State for several years. Wind erosion, the use of top soil, and necessary time frames required to minimize erosion impact are items of concern. The Companies have responded as follows:

> "Essentially all the overburden will be cast into spoil piles in the mined-out pits. The windrows and conical piles of overburden deposited by the stripping draglines will be graded to reduce peaks and ridges to maintain the natural appearance of the area and to minimize erosion. It is presently contemplated that spoil piles will be sufficiently smoothed or rounded by tracked equipment at the earliest practicable time in order that the affected areas may be planted to stable ground covers. This may require slopes level enough to permit the use of farm implements such as seed drills, tractors and rippers for aeration.
>
> "The Companies have engaged the services of the Wyoming Agricultural Experiment Station of the University of Wyoming who, together with the Companies' own environmental biologists and agronomists, will determine the most suitable types of vegetation for the reclaimed areas. These studies will also assist in the determination of the most effective methods of propagation. The Companies will review, among other things, the efficacy of fertilization , soil treatment and irrigation, in their work to revegetate the mined area.
>
> "A test mine has been prepared at the Jim Bridger site for mining the coal burned in the pilot electrostatic precipitator test, and in conjunction, a research spoil pile created for reclamation test purposes. Reclamation experiments will begin in the spring of 1972 and will include investigations of contouring and grading procedures, soil preparation and chemistry, plant species adaptability, use of fly ash for soil conditioning and other considerations of importance to proper reclamation.
>
> "With the aid of their consultants, Pacific and Idaho Power Company will maintain close contact with other researchers and agencies working in the field of reclamation, including the Soil Conservation Service, to assure that the most up-to-date knowledge is employed as reclamation is carried on.
>
> "The mine Reclamation Research Program under contract by the Companies with the University of Wyoming Agricultural Experiment Station includes studies designed to determine the effectiveness of snow fences or other devices for limiting the harsh effects of limited rainfall and wind erosion on mined areas of the Jim Bridger coal field. The Companies have also discussed erosion

> control measures with Mr. Harold Cooper, State Conservationist, Soil Conservation Service, Casper, Wyoming and plan to begin further contact with him so that we will be fully informed of the expertise and technical information available through the SCS.
>
> "A test reclamation area at the Jim Bridger mine has been prepared. Topsoil, as was available, was scraped from the overburden and stored separately for testing purposes. The University of Wyoming will, among other things, compare the use of topsoil versus no topsoil for reclamation. If these tests indicate that such topsoil is necessary for reclamation purposes, the ultimate plan will provide for its use.
>
> "We estimate that the proposed mining operation at Jim Bridger will disturb the surface soil and vegetation at the rate of an average of 125 acres per year for the life of the project. It will be the Owners' practice to restore and reclaim the mining area as soon after the overburden is removed as conditions will permit. We plan to have the reclamation activity keep in step with the mining activity, following about twelve months behind the initial disturbance of the particular area that is being mined. If plant growth does not reach an acceptable level in a particular area because of unfavorable conditions during planting, the area will be replanted.
>
> "Although at this time the mining plan for Jim Bridger is not fully developed, it will consist of a step-by-step operation for overburden removal, coal removal and reclamation. The basic mining procedure at Jim Bridger will lend itself to fairly early reclamation after the overburden and coal are removed. Once the mining activity is fully operational, the time lapse between start of overburden removal and start of reclamation activity will be 6 to 24 months."

Reclamation of arid areas such as that at Jim Bridger commonly presents problems; however, the analyses, studies, experience and review of literature have indicated that when factors such as the re-use of top soil, bank contouring, slope gradients, and the planting season are taken into consideration, reclamation of such areas can be successful.

D. PLANT SITE OPERATION, DISPOSAL AND MONITORING SYSTEM

The need for specific plans relative to handling and effects of cooling tower residue, waste water and fly ash on ground or surface water systems has been identified. The Companies have presented their current plans for control and disposal of plant waste materials:

> "The cooling water for each of the generating units will be recycled to the maximun extent possible and the residual surplus waste water will be impounded in areas near the plant and permitted to evaporate, thus preventing the release of any contaminated water.
>
> "The major source of waste water will be from cooling tower blowdown which is currently estimated at 2,800 gpm for all three units. Some of this water will be used for sluicing the bottom ash to ash-holding silos at the plant. Additional amounts will be used to wet the fly ash to prevent the fly ash from becoming airborne. After these uses of the cooling tower blowdown, there will be a net quantity which will require disposal in evaporative ponds located on the east side of Deadman Wash, south of the power plant location. This type of evaporative system would allow the water to return to the hydrologic cycle as vapor and leaving behind the residue in nearly solid form. As the residue builds up in the ponds, it will be removed and disposed of by burial at the mine. The embankments enclosing the evaporative ponds will provide a physical barrier which would prevent contaminated water from reaching surface and ground water systems. The ponds are proposed to be located within the area of the Lewis shale which will provide a seal to the aquifer in the area.
>
> "In regard to surveillance of underground water supplies in the area of the power plant, the Owners plan to monitor a well currently existing at the location. The Owners have determined that the main aquifer in the area, the Erickson sandstone, is located at a depth exceeding 700-feet below the surface of the ground. Additional, but minor aquifers may exist in the lower Almond formation in depths exceeding 400-500 feet below the ground surface. This information was confirmed during the drilling of the deep water well at the plant site in the southwest quarter of Section 3. The Lewis shale, which is generally conceded by the best geological

opinion to be impermeable, is located above the aquifer. However, to verify that no contamination reaches the Erickson aquifer, the Owners will monitor the quality of the water in the well. The quality of the water will be tested on a regular basis both before and after the operation of the generating units.

"In regard to surveillance of surface waters in the area of the plant site, the Owners will monitor various locations in the area. We do not believe there can be any contamination of local waters because a closed cycle - evaporative cooling pond system will be used for plant waste waters. The only water released to local water courses will be the small amount from the sewage treatment plant, which provides for disposal of sewage from the sanitary facilities located in the power plant, office building, warehouse and coal service buildings. The sewage treatment facilities are designed for multiple stages of treatment, including extended aeration and settling, with supplemental oxidation and chlorination prior to final release, thus insuring quality water releases.

"The design flow for sewage treatment facilities is 12,000 gallons per day, which is the peak waste flow expected during construction of the main power plant. A flow of 6,250 gallons per day is expected during normal plant operation, following the construction period.

"The facility also includes a 1000 gallon sludge holding tank, which will be emptied as required by a scavenger service.

"The design of the sewage treatment facility has been approved by the Wyoming Department of Health and Social Services and has been in operation since early fall, 1971. The Owners plan to perform tests for dissolved oxygen, bio-chemical oxygen demand, pH, flow and other characteristics of the discharge on a regular basis.

"Prudent and careful planning of drainage ditches will be exercised to eliminate any adverse affect from the small amount of rainfall on the plant area.

"We are certain that no contamination of local surface waters can occur from the proposed system, however, to confirm this position we will monitor surface waters in at least three locations on a regular basis for both prior and after plant operation: (a) Deadman Wash just north of the plant site to determine possible contamination coming from the mine; (b) The east edge of the plant site, to determine possible contamination from precipitation on the plant facilities, and (c) A location downstream of the evaporative ponds, to determine any leakage from the evaporative ponds. The Owners intend to begin a water

> sampling program within the next few weeks of Deadman Wash and Bitter Creek to determine the quality of this water prior to plant operation."

The companies' proposal for preventing adverse effects from the processing and stockpiling of coal at the plant are outlined as follows:

> "The coal processing, handling and stockpiling system at the power plant will be designed so as to preclude any significant impact on the environment. To achieve this objective, dust suppression equipment will be provided at dust producing areas in the coal processing and handling system. In addition, all outdoor conveyors will be provided with metal housing to eliminate dust due to wind action.
>
> "The coal will be stockpiled into two primary areas, the ready-pile and the long-term storage pile. To eliminate possible dust associated with the long-term storage pile, it will be compacted or sealed with a surfacing compound. Dust from the ready-pile will be controlled through the use of dust-suppression equipment associated with the stacking and reclaiming equipment.
>
> "When the coal is delivered to the power plant, it will be crushed to a size ranging up to 6-inch maximum prior to stockpiling. To minimize dust, all outdoor coal storage will be this size. Secondary crushing to 1 1/4-inch maximum will not be done until immediately prior to conveyance to the coal silos in the power plant."

The companies have signed a contract for an ecological inventory and a monitoring study with the Unversity of Wyoming. Base line data is presently being gathered and a system designed to monitor the effects of the Plant's emissions. Soil, vegetation and small animal conditions before and after operation of the generation plant can then be calculated. The Bureau of Land Management and the Wyoming Game and Fish Commission are to be kept informed on progress.

With regard to an air and water monitoring program after the power plant is in operation, the Companies responded with the following:

> "The Companies recognize the importance of monitoring and

surveillance systems to verify the air quality and water quality of the area after the plant is in operation. Therefore, we plan to take the following specific action:

A. Air Quality

1. An opacity recording device will be installed in the chimney of each unit.

2. NO_x and SO_x recording devices will be installed in the chimney of each unit. At this time, there are no reliable instruments for continuous measuring of these substances. We expect that such proven devices will be available when the units are ready for commerical operation. However, if such devices are not avialable, we plan to use technicians to sample and analyze the flue gas, on a regular basis, until measuring equipment is avialable for installation.

3. Daily analysis of the sulfur content in the coal.

4. Periodic tests to determine precipitator performance.

5. The program with Western Scientific Services , Inc., relating to the area meteorological and climatological conditions will be continued for at least two years after the operation of Unit #1. This program also includes measurement of dustfall and ambient SO_2 levels.

6. The current program with the University of Wyoming Agricultural Experiment Station will be continued to investigate flora and fauna conditions after the units are in operation, for a sufficient period of time.

As we have related to you in other correspondence, we plan to monitor both surface and ground water conditions both prior to and after commencement of operation of the plant."

Three permanent sampling stations have been established by Western Scientific Services, Inc., for the Companies. Sites are located at (1) 4 miles northwest of the plant site; (2) 11 miles east of the plant site, and (3) at the plant site itself. Three sets of measurements were made in June and August 1971. Particulates were measured using high volume samplers with 24-hour measurement periods. Sequential 2-hour time periods were examined with tape samplers which measure the "coefficient-of-haze" (COH). A conductometric type recorder was used to measure sulfur dioxide (SO_2).

Passive type measurements using dustfall jars and sulfation plates with a near 30 day collecting period were located at 24 surrounding points. These collection sites are shown on the next page.

In addition to the Company's monitoring program described previously no Federal permits should be issued until a monitoring system is designed and implemented that will:

1. Determine if state and federal ambient air standards are being met;
2. Monitor build up of trace elements in soil and vegetation.

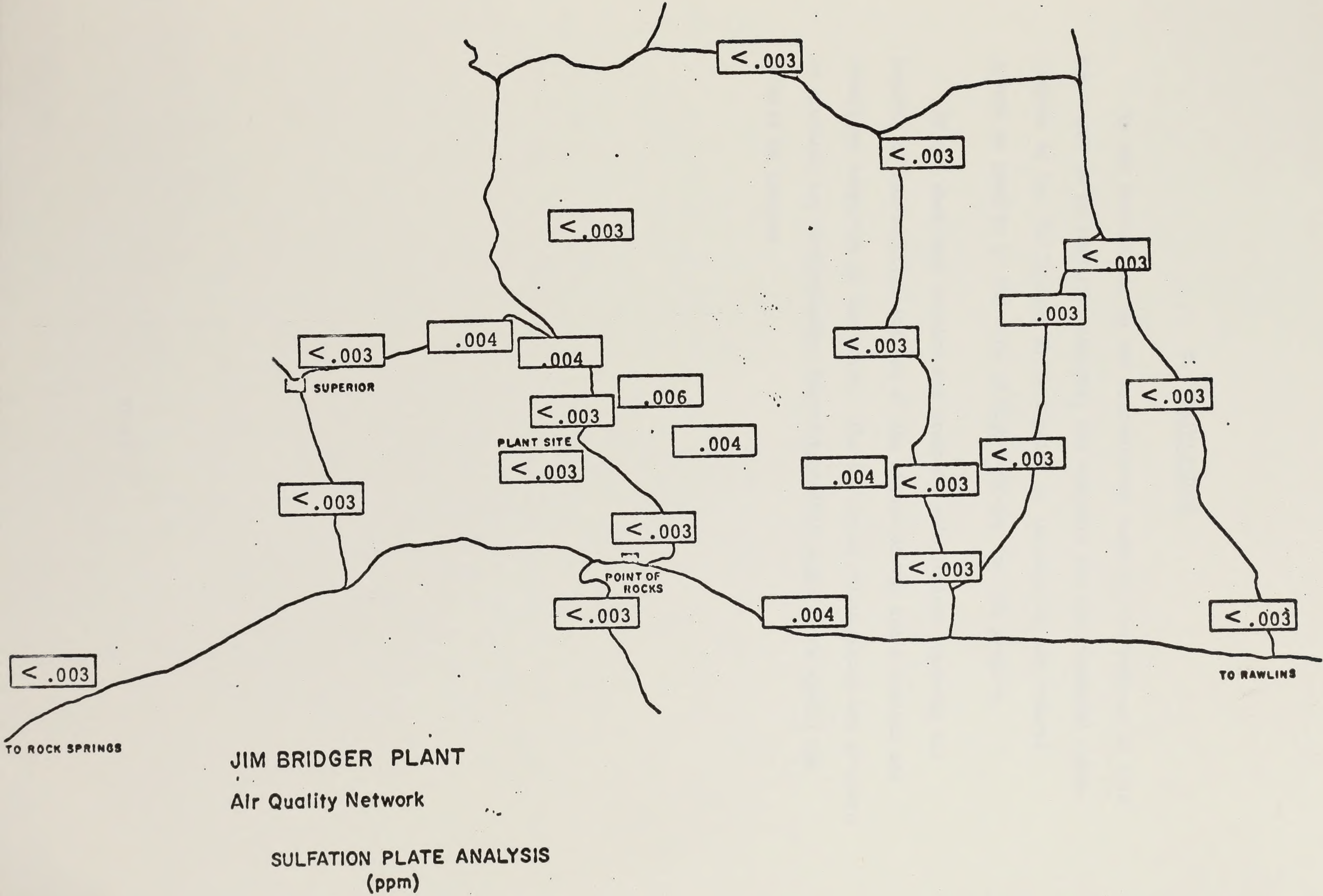

Figure 18. Background SO_2 Concentrations in the Jim Bridger Network for June, 1971.

E. STIPULATIONS

As was pointed out in the introductory summary, the purpose of this statement is to identify, analyze, and evaluate the environmental consequences of the Jim Bridger Project prior to issuance of any Federal grants or permits in the form of rights-of-way for the project.

If and when such permits are granted, stipulations covering all aspects of construction and use of the rights-of-way are a crucial and mandatory component of the grant. The following stipulations are proposed to minimize any environmental degradation that might occur should the permits be granted.

Easement for Right-of-Way for Electrical Power Transmission Line

Pursuant to the Act of March 14, 1911, as amended, 43 USC s 961 (1970), and subject to valid existing rights, there is hereby granted to the Idaho Power Company and the Pacific Power and Light Company, herein after referred to as Grantee, an easement for a right-of-way over, across and upon the public lands and reservations of the United States within the State of ____________________ for an electrical power transmission line.

The easement hereby granted is for that portion of a 345 KV Electrical Power Transmission Line extending from the

which is situated in the State of __________. Use of said easement for additional transmission lines or for other purpose is prohibited unless separately approved by the Department of the Interior. The route of the Line is delineated on maps comprising Exhibit A of Grantee's application for an easement dated __________________, which was filed with the Bureau of Land Management on ____________________, in file No. ____________. The term of this grant is fifty (50) years from the date hereof. The width of the right-of-way hereby granted is _____________ feet, being to the extent of ________________ feet on each side of the centerline of the Line.

An annual charge for the use and occupancy of public lands under the authority of this right-of-way permit will be determined by the Authorized Officer in accordance with the provisions of 43 CFR 2802.1-7.

The annual charge shall be paid by Grantee to the Authorized Officer. Written notice of the amount of the annual charge will be given annually in advance by the Authorized Officer to Grantee.

This grant is made upon the express condition that each of the terms and conditions hereof, which are appended hereto and incorporated herein, shall be fully complied with by Grantee, and by accepting this grant, Grantee agrees and covenants to fully comply with each said terms and conditions, and to make timely payment of annual charges. Failure of Grantee to comply with said terms and conditions shall be cause for cancellation of this grant.

UNITED STATES OF AMERICA

by________________________
State Director for_____
Bureau of Land Management
(City) (State)s

County of________________)

State of_________________)

Before me,_________________________, a Notary Public in and for the County of______________, State of_______________, on this_____ day of_______________ 1972, personally appeared_______________, the State Director for_________________, Bureau of Land Management, (City), State, to me known to be the identical person who executed the foregoing instrument and acknowledge to me that he executed the same as a free and voluntary act and deed for the uses and purposes set forth therein.

____
Notary Public

My commission expires_________________

Accepted for the (grantee)

____
(Name and Title)

(add Notary certificate)

Part I. Right-of-Way Construction and Maintenance-Terms and Conditions

A. Definitions:

As used in this Part I of these terms and conditions, the following terms have the following meanings:

1. "Authorized Officer" means the ____________ State Director of the Bureau of Land Management or his delegate. The term is synonymous with "Superintendent in Charge" referred to in 43 CFR, Part 2800.
2. "Line" means the 345 KV Power Transmission Line which is the subject of this right-of-way grant.
3. "Grantee" means the Idaho Power Company and the Pacific Power and Light Company and any other company which at any time owns or operates the Line.

B. Bonding Requirements

1. Within Thirty (30) days after issuance of the ________ electrical power transmission line right-of-way easement grant(s) necessary for construction of the Line but before construction begins, Grantee shall furnish the United States a surety bond or other security (hereinafter called "Bond") of such type and on such terms and conditions as are acceptable to the Secretary of the Interior, in the principal amount of ____________. Said Bond shall at all times be maintained in force and effect in the full principal amount until construction of the Line is completed and until the Bond is released in writing by the Secretary of the Interior.

   Said Bond shall have the purpose of: (1) ensuring the performance by Grantee of each and every obligation of Grantee under the terms and conditions of this grant and any permit issued to Grantee by the United States in connection with the Line; (2) providing for immediate payment to the United States of any cost or obligation incurred by the United States in performing any said obligation of Grantee which in the judgement of the Authorized Officer, Grantee has not performed satisfactorily; and (3) insuring the payment, within the amount of said Bond of any final judgment.

These bonding requirements are in addition to, and are not intended to affect, all other requirements of law, nor are they intended to limit in any way Grantee's liability under any provision of law.

C. Authorized Officer Responsibilities

1. The Authorized Officer may at any time inspect the onsite construction and maintenance activities of Grantee in connection with the Line. Official representatives of State and other Federal agencies may also inspect such activities if necessary to the performance of official duties which relate to the Line.

2. For purposes of information and review, the Authorized Officer may call upon Grantee at any time to furnish any or all data related to pre-construction, construction and maintenance activities undertaken in connection with the Line.

3. Except where the approval of the Authorized Officer is required before Grantee may commence a particular operation, neither the United States nor any of its agents or employees agrees, or is in any way obligated, to examine or review any plan, design, specification, or other document which may be filed with the Authorized Officer by Grantee pursuant to these terms and conditions.

4. The absence of any comment by the Authorized Officer or any other employee of the United States with respect to any plan, design, specification, or other document which may be filed by Grantee with the Authorized Officer shall not be deemed to represent in any way whatever any assent to, approval of, or concurrence in such plan, design, specification, or other document or of any action proposed therein.

5. The Authorized Officer may not delegate his authority to:

   (a) Modify the Line

   (b) Suspend construction or maintenance activity.

   (c) Approve construction or maintenance activities which do not conform to descriptive and technical data heretofore submitted to the Bureau of Land Management.

   (d) Revise or amend these terms or conditions where unforeseen conditions arise.

D. Liaison

Grantee shall designate a representative for field operations who shall be the sole field representative of Grantee and Grantee's contractors in dealings with the Authorized Officer; said representative shall be empowered on behalf of Grantee and Grantee's contractors to communicate with the Authorized Officer and to receive and comply with all communications and decisions of the Authorized Officer.

Grantee shall keep the Authorized Officer informed of any change in the name of Grantee's contact representative for field operations during construction of the Line and related facilities.

Grantee shall keep the Authorized Officer informed of its principal place of business and of the names and addresses of the principal officers at all times during the term of this grant.

E. Preconstruction Conference

1. Before construction begins, the Grantee's representative will establish a suitable date with the Authorized Officer for a preconstruction conference.

2. At the conference the Grantee will present a complete plan of operation, including but not limited to:

   (a) Construction sequences, methods and equipment to be used in all phases.

   (b) Tentative routes of temporary and permanent access roads.

   (c) Location and extent of surface disturbing activities connected with each construction phase and restoration plans therefor.

   The Authorized Officer will make a timely response pointing out modifications needed to protect resource values and will furnish Grantee the details of soil conservation and vegetative restoration techniques to be used.

F. Modification and Suspension

1. During the preconstruction and construction periods, the Authorized Officer may require Grantee to make such modification of the Line as he deems necessary to protect or maintain stability of geologic materials, fish and wildlife habitats, the environment, and the public interest, without liability or expense to the United States.

2. The Authorized Officer at any time may issue a written decision suspending any construction or maintenance activity of Grantee in connection with the Line which, in the judgment of the Authorized Officer, immediately threatens serious or irreparable harm to life (including wildlife and aquatic life), property, or the environment. In the event the Authorized Officer determines that Grantee has failed or refused to comply with any provision of this grant or any permit issued by the Department of the Interior in connection with the Line, and after due notice including a reasonable time to rectify the problem he may issue a written decision suspending any or all of Grantee's construction activities under said grant and permits. Grantee shall not resume such suspended activities until given written authorization to do so by the Authorized Officer. Any dispute arising under this grant shall be decided by the Authorized Officer.

3. Any decision or approvals of the Authorized Officer which are required herein to be in writing may in emergencies be issued orally, with subsequent confirmation in writing as soon thereafter as possible.

G. Appeals

Decisions of the Authorized Officer shall be effective upon issuance, unless they specifically provide otherwise. Grantee may appeal any such decision directly to the Secretary of the Interior. The regulations of the Department of the Interior relating to hearings and appeals, 43 CFR Part 4,

shall not be applicable to such an appeal. If an appeal is to be taken notice of appeal shall be filed with the Secretary of the Interior within thirty (30) days after issuance of the decision being appealed. The notice shall set forth with particularity the decision being appealed, the facts of the matter and the applicable law, together with such written showing and argument on the facts and law as Grantee may wish to present to justify modification or reversal of the decision. All statements of fact shall be under oath. Unless the Secretary of the Interior orders otherwise for good cause shown, the decision of the Authroized Officer shall not be suspended during the pendency of the appeal, but shall continue in full force and effect.

H. General Requirements

1. Grantee shall construct and maintain the Line in conformity with the descriptive and technical data heretofore furnished the Bureau of Land Management in connection with Grantee's application for the Line. Construction or maintenance activities which are not in substantial accord with such data may not be initiated without the prior written approval of the Authorized Officer. Approval of substantial variances will not be given unless the need therefore is fully justified by Grantee.

2. If at any time hereafter, Grantee wishes to reconstruct, remodel, or relocate any portion of the right-of-way hereby granted, or any of the improvements thereon, the prior written approval of the Authorized Officer must be obtained. No such approval will be given unless the request is fully justified by Grantee and is authorized by law. Where necessary, Grantee shall make application under appropriate regulations.

shall not be applicable to such an appeal. If an appeal is to be taken notice of appeal shall be filed with the Secretary of the Interior within thirty (30) days after issuance of the decision being appealed. The notice shall set forth with particularity the decision being appealed, the facts of the matter and the applicable law, together with each written comment and statement of the facts and law as Grantee may wish to present to justify modification or reversal of the decision. All statements et such shall be under oath. Unless the Secretary of the Interior orders otherwise for good cause shown, the decision of the Authorized Officer shall not be suspended during the pendency of the appeal, but shall continue in full force and effect.

B. General Requirements

1. Grantee shall construct and maintain the line in conformity with the drawings and documents which Grantee furnished the Bureau of Land Management in connection with Grantee's application for the line. Construction or maintenance activities which are not in substantial accord with such information is prohibited without the prior written approval of the Authorized Officer. Approval of substantial variations will not be given unless the need therefor is fully justified by Grantee.

2. If at any time hereafter, Grantee wishes to reconstruct, remodel, or relocate any portion of the right-of-way hereby granted, or any of the improvements thereon, the prior written approval of the Authorized Officer shall be obtained. No such approval will be given unless the request is fully justified by Grantee and is acceptable to him. Where necessary, Grantee shall make application under appropriate regulations.

3. With regard to the location, construction and maintenance of the Line: (a) Grantee shall ensure full compliance with the terms and conditions of this grant by its agents, employees and contractors (including sub-contractors of any tier), and the employees of each of them; (b) Unless clearly inapplicable, the requirements and prohibitions imposed upon Grantee by these terms and conditions are also imposed upon Grantee's agents, employees, contractors, and sub-contractors, and the employees of each of them; (c) Failure or refusal of Grantee's agents, employees, contractors, sub-contractors, or their employees to comply with these terms and conditions shall be deemed to be the failure or refusal of Grantee; (d) Grantee shall require its agents, contractors or sub-contractors to include these terms and conditions in all contracts and sub-contracts which are entered into by any of them together with a provision that the other contracting party, together with its agents, employees, contractors and sub-contractors, and the employees of each of them shall likewise be bound to comply with these terms and conditons.

4. Unforeseen conditions arising during the term of this grant may make it necessary to revise or amend these terms and conditions to protect the environment and the public interest. In that event, Grantee and the Authorized Officer shall agree as to what revisions or amendments shall be made. If they are unable to agree, the Secretary of the Interior shall have final authority to determine the matter.

5. Grantee shall make separate application, under applicable statutes and regulations, for additional authorizations to use or occupy Federal lands in connection with the Line.

6. Grantee agrees and consents to be bound by the terms and conditions set forth at 43 CFR 2801.1-5 and 2851.1-1.

7. Grantee acknowledges and agrees that the grant of this right-of-way shall be subject to the express condition that the exercise thereof will not unduly interfere with the management, administration, or disposal by the United States of the lands affected thereby, and that he agrees and consents to the occupancy and use by the United States, its grantees, permittees, or lessees of any part of the right-of-way not actually occupied or required by the project, or the full and safe utilization thereof, for necessary operations incident to such management, administration or disposal.

8. Grantee shall pay the United States the full value for all damage to the lands or other property of the United States caused by Grantee or by its employees, contractors, or employees of the contractors, and shall indemnify the United States against any liability for damage to life, person or property arising from the occupancy or use of the lands under the right-of-way. Provided, however, that if Grantee has no legal power to assume such a liability with respect to damage caused by it to lands or property, Grantee in lieu thereof agrees to repair all such damage.

9. (a) Grantee shall abate any condition existing with respect to the Line that causes serious and irreparable harm or damage to any person or property.

(b) Any property or resource harmed or damaged by Grantee in connection with

the Line shall be reconstructed, repaired and rehabilitated by Grantee to the written satisfaction of the Authorized Officer.

10. As provided by 43 CFR 2851.2-1(c)(6)(ii), Grantee shall locate, design and construct the Line and related facilities, including access roads, consistent with the criteria jointly established by the Secretary of the Interior and the Secretary of Agriculture and set forth in the publication entitled "Environmental Criteria for Electric Transmission Systems." Representatives of Grantee and Grantee's contractors shall confer with the Authorized Officer at such times before, during and after construction of the Line as the Authorized Officer may request for the purpose of ensuring compliance by Grantee with the terms of this subsection.

11. Grantee shall provide for the protection and enhancement of aesthetic values in the planning, construction and maintenance of the Line. Tower and support facilities will have dull or non-reflective finishes that harmonize with their natural setting or are otherwise appropriate in areas exposed to frequent public view. Non-reflective conductor cable will be used when the conductors are exposed to frequent public view. The Authorized Officer may require any additional reasonable measures he deems necessary to protect the aesthetic values in critical areas.

12. Prior to construction, Grantee shall make a survey and inventory of archaeological, paleonthological, and historical sites within the area to be occupied by the right-of-way and the access roads. The results of this survey will be provided to the Authorized Officer. The Authorized Officer

the line shall be constructed, operated and maintained in conformity to the written authorization of the Authorized Officer.

(d) As provided by 43 CFR 2801.1-5(b)(10), Grantee shall control erosion and construct the line and related facilities, including access roads, in accordance with the criteria jointly established by the Secretary of the Interior and the Secretary of Agriculture and set forth in the publication entitled "Environmental Criteria for Electric Transmission Systems." Representatives of Grantee and Grantee's contractors shall meet with the Authorized Officer at such times before, during and after construction of the line as the Authorized Officer may request for the purpose of ensuring compliance in accordance with the terms of this authorization.

(e) Grantee shall provide for the protection and enhancement of aesthetic values in the planning, construction and maintenance of the line. Towers and support facilities will have dull or nonreflective surfaces blending with their natural setting or pre-existing surroundings. In areas subject to frequent public view, non-specular conductor cable will be used where the conductors are exposed to frequent public view. The Authorized Officer may require the additional reasonable measures he deems necessary to protect the aesthetic values in critical areas.

(f) Prior to construction, Grantee shall make a survey and inventory of archaeological, paleontological, and historical characteristics of the area to be occupied by the right-of-way and the access roads. The results of this survey will be provided to the Authorized Officer. The Authorized Officer may require Grantee to relocate the proposed transmission line facilities in order to avoid destruction of archeological, paleontological, or historic values or to delay construction until salvage operations are completed. All costs of inventory, survey and salvage operations will be borne by Grantee. All salvage shall remain the property of the United States.

13. The right-of-way herein granted shall be subject to the express covenant that it will be modified, adapted, or discontinued if found by the Secretary to be necessary, without liability or expense to the United States, so as not to conflict with the use and occupancy of the land for any authorized works which may be hereafter constructed thereon under the authority of the United States.

14. Before construction on any section of transmission line may commence, there shall be written agreement between the Authorized Officer and Grantee regarding the location of tower sites, access roads and related facilities, and the construction and restoration methods necessary to meet the objectives and requirements of this grant. During construction there will be periodic inspections by the Authorized Officer to ensure compliance. A post-construction inspection and conference will be held between Grantee and the Authorized Officer to assure that construction and restoration has been completed in accordance with this grant and, if not, to determine how inconsistencies shall be rectified.

15. Grantee shall construct the Line so that it will conform to all applicable Federal Regulations regarding aircraft safety. The Authorized Officer may also require appropriate additional aircraft marking and devices at various locations as he deems necessary.

16. In all its operations under this grant, Grantee shall comply with all applicable Federal, State and local laws and regulations concerning the use of poisonous substances, including but not limited to, insecticides, herbicides, fungicides, and rodenticides. Grantee shall prepare a written plan of use of such substances which must be approved by the Authorized Officer before such substances may be used by Grantee on or near the right-of-way. The plan shall state the type and quantity of material to be used, the pest to be controlled, the method of application and such other information as the Authorized Officer may require. All use of such substances on or near the right-of-way shall be in accordance with the approved plan. If the use of a poison is prohibited by the Secretary of the Interior, it shall not be used. If use of a poison is limited by the Secretary of the Interior, it shall be used only in accordance with that limitation.

17. Grantee shall remove or dispose of all waste caused by its activities in a manner satisfactory to the Authorized Officer. The term "waste" as used herein means all discarded matter, including but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment. Construction campsites will be maintained in a sanitary condition at all times and garbage and refuse at these sites will be disposed of promptly.

18. Within ninety (90) days of completion of construction of the line, Grantee shall submit a maintenance plan to the Authorized Officer for approval. The plan shall specify the types and frequency of reoccurring activities to be conducted by Grantee within and along the right-of-way. Either party may request that the maintenance plan be updated to meet changing conditions. Amendments and revisions of the maintenance plan shall be approved by the Authorized Officer.

19. Within ninety (90) days after conclusion of construction operations, all construction materials and related litter and debris, including vegetative cover accumulated through land clearing, will be disposed of in accordance with a plan approved by the Authorized Officer.

20. Proof of construction of the Line must be filed within five (5) years of the date of this grant.

21. If during construction, there are deviations from the location of facilities as shown on the original maps, Grantee shall file relinquishment of the unused portions of the right-of-way. The relinquishment shall be accompanied by a map of the amended location of the right-of-way for the project as actually constructed, in accordance with 43 CFR 2802.2-2.

22. Upon revocation or relinquishment of the right-of-way, Grantee shall remove all equipment and improvements. Grantee shall restore the land, so far as it is reasonably possible to do so, to its original condition to the satisfaction of the Authorized Officer.

23. Grantee shall comply with applicable Federal and State laws and regulations issued thereunder, existing or hereafter enacted or promulgated, affecting in any manner construction, operation, maintenance or dismantling of the Line.

24. In the construction, operation, and maintenance of the Line, Grantee shall not discriminate against any employee or applicant for employment because of race, creed, color, sex, or national origin and shall require an identical provision to be included in all subcontracts.

I Construction Requirements

1. Grantee shall submit a timetable of construction for review of the Authorized Officer fifteen (15) days in advance of construction.

2. If grantee or its contractors require materials for construction purposes from the public lands, application shall be made under applicable regulations for such materials. Permittee shall submit a mining plan and effect reclamation of the land in accordance with 43 CFR, Part 23. No material may be removed by Grantee or its contractors without the written approval of the Authorized Officer. Insofar as possible, use of existing material sites will be authorized in preference to new sites.

3. Grantee shall promptly notify the Authorized Officer of the amount of merchantable timber, if any, which will be cut, removed, or destroyed in the construction and maintenance of the project and shall pay the United States through the Authorized Officer, in advance of construction, such sum of money as the Authorized Officer may determine to be the full stumpage value of the timber to be so cut, removed, or destroyed.

4. Grantee shall conduct all construction and maintenance activities in a manner that will minimize disturbance to vegetation, drainage channels, and streambanks. Construction methods shall be designed to prevent degradation of delicate soil conditions in areas where such degradation would result in detrimental erosion or subsidence. Grantee shall take any other

such soil and resource conservation and protection measures on the land covered by the right-of-way as the Authorized Officer determines are necessary.

5. Clearing of the right-of-way shall be limited to the extent and manner directed by the Authorized Officer. Grantee shall dispose of all vegetative and other material cut, up-rooted, or otherwise accumulated during the construction and maintenance of the Line in such manner as the Authorized Officer may specify to decrease the fire hazard.

6. All clearing shall be done with hand tools, except where done for road or tower sites, or as otherwise approved by the Authorized Officer. Scalping of top soil and removal of low growing vegetation will not be allowed outside the road area and tower sites.

7. Public land areas used for temporary access roads, campsites, equipment storage, and other construction activities shall be restored by Grantee to their natural state insofar as practicable and in accordance with a restoration plan approved by the Authorized Officer.

Whenever revegetation is required under the restoration plan, Grantee shall file a report with the Authorized Officer when such planting is completed. The report shall contain information regarding the location of the area; the type of planting or seeding, including mixtures and amounts; the date of planting; and other relevant information as may be required by the Authorized Officer.

Inspection and evaulation of restorative measures taken will be made by the Authorized Officer as soon as it is possible to determine if a satisfactory growth has been established. In no instance shall this vegetative cover check be made until after completion of the first growing season.

8. Grantee shall take such soil and resource conservation and protection measures, including weed control, on the land within the right-of-way as the Authorized Officer may require.

9. Grantee shall conduct all construction, operation and maintenance activities in a manner that will avoid or minimize degradation of air, land, and water quality. Toxic material shall not be released in any lake or water drainage. All construction work and subsequent use of the right-of-way must be consistent with applicable Federal, State and local standards relating to safety, water quality and public health. Unless otherwise approved in writing by the Authorized Officer, dikes or cofferdams shall be installed to separate concrete work areas from lakes or streams during construction. Mobile ground equipment shall be kept within the right-of-way and out of the waters of lakes, streams or rivers except as permitted by the Authorized Officer.

10. Grantee shall take such measures as are necessary to assure unrestricted passage and movement of fish and wildlife. No artificial structure or stream channel change that causes a permanent blockage to movement of fish shall be erected or constructed. Grantee shall take all necessary precautions to protect fish and wildlife as determined by the Authorized Officer. By advance written notice from the Authorized Officer, key fish and wildlife areas may be closed to construction activities for specified periods of time to protect designated fish and wildlife species.

11. Grantee shall do everything reasonably within its power, both independently and on request of any duly authorized representative of the United States, to prevent and suppress fires on or near the lands to be occupied under the right-of-way, including making available such construction and maintenance forces as may be reasonbably obtainable for the suppression of such fires.

12. Grantee shall build and repair such roads, fences, and trails as may be destroyed or injured by construction work and shall build and maintain necessary and suitable crossings for all roads and trails that intersect the works constructed, maintained, or operated under this grant.

J. Roads and Access Requirements

1. Grantee shall permit free and unrestricted public access to and upon the right-of-way for all lawful and proper purposes, except in areas designated as restricted by Grantee with the consent of the Authorized Officer in order to protect the public safety or facilities constructed on the right-of-way.

2. During construction, Grantee shall regulate public access and vehicular traffic as required to facilitate construction operations and to protect the public, wildlife, and livestock from hazards associated with the project. For this purpose, Grantee shall provide warnings, flag men, barricades and other safety measures.

3. Grantee will be responsible for providing and installing caution and regulatory signs that are necessary for the safety of users of access roads.

4. Grantee may construct and maintain a permanent access system which may be interconnected with existing permanent roads, along the right-of-way to facilitate construction and maintenance of the line. The Authorized Officer and Grantee shall cooperate in selecting the location of such permanent access road system. The Authorized Officer must approve the location of the roads before construction may begin and may designate areas where construction of permanent roads is prohibited. In locating the permanent access roads, consideration will be given to topography, soil, and watershed conditions, vegetative cover, existing roads, other land uses, and historical, archeological and paleontological values.

5. Design standards for the permanent access roads shall be approved by the Authorized Officer and will follow Bureau of Land Management standards in Bureau of Land Management Manual 9110. A normal standard road will be required with maximum width of 14 feet, except at turnouts which will be required every 1,000 feet. Grades shall not exceed eight percent. In order that the roads may be used without damage during adverse weather conditions, their surface shall consist of pit run 3-inch minus gravel to a depth which shall be determined by the Authorized Officer, but not to exceed a depth of 6-inches.

Part II. Plant and Associated Facilities--Terms and Conditions

A. Definitions:

1. "Authorized Officer" means the _____________ State Director of the Bureau of Land Management or his delegate. The term is synonymous with "Superintendent in Charge" referred to in 43 CFR, Part 2800.

2. "Plant" means the Jim Bridger Generation Station and its associated facilities.

3. "Grantee" as used in this Part II of these terms and conditions means the Idaho Power Company, the Pacific Power and Light Company, and any other company which at any time owns or operates the Plant.

B. Applicability:

1. Grantee shall comply with all requirements of applicable Federal, State and local law, including all applicable regulations, standards, implementation plans, abatement schedules, and enforcement actions for environmental quality. Nothing herein shall be construed to relieve Grantee from such compliance.

C. Air Pollution:

1. Emissions from all generating units of the Plant shall at no time exceed the New Source Performance Standards set forth in the Environmental Protection Agency regulations which were promulgated on December 23, 1971, 36 F.R. 24877, notwithstanding any exception contained in said regulations that otherwise might apply to any of said generating units.

2. Emissions from all generating units of the Plant shall at no time cause to be exceeded the applicable National Ambient Air Quality Standards (both primary and secondary) and the associated Wyoming State Implementation Plan as approved by the Environmental Protection Agency.

D. Water Pollution Control Requirements:

1. Grantee shall operate the Plant, including the water delivery and waste disposal systems, in full compliance with Federal, State and local water quality laws, regulations and standards.

E. Mined Land Reclamation Requirements:

1. Grantee shall comply with 43 CFR, Part 23, with regard to public lands affected by Grantee's strip mining operations. Grantee agrees to restore all non-Federal lands affected by Grantee's strip mining operations in a manner and to a degree at least equal to the restoration of the public lands.

F. Other Environmental Considerations:

1. Grantee shall submit plans to the Authorized Officer regarding noise abatement, dust abatement, and disposal of ash for review and comments.

G. Review:

1. Grantee's plans and programs for implementing these terms and conditions shall be subject to review and comment by the Authorized Officer at least once every five (5) years.

VII

ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

VII. ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

Construction of the generating plant will introduce a man-made industrial feature into an area which now exhibits an open space desert character. While the semi-remote location and undulating topography will shield the major part of the complex from view along Interstate 80, the smoke stacks and particulate emissions from the stacks may be visible to Interstate traffic. Stack emissions are expected to have adverse impacts on the environment through degradation of local visibility and potential long-term changes in the ecosystem. It is not known if all such changes will be adverse, but certain plant species within 1 to 2 miles of the plant may be affected.

The proposed mining operation will disturb the surface soil and vegetation at the rate of 125 acres per year for the life of the project. While the Companies' stated plan is to reclaim and restore the disturbed surface to the same general topography that existed before disturbance, it is estimated that 125 to 375 acres may be in the process of stripping, mining, backfilling, and early stages of reclamation at any given time. Once the mining activity is fully operational, the time lapse between start of overburden removal and start of reclamation activity will be 6 to 24 months.

Dust from disturbed areas is, to a certain extent, unavoidable. Because of wind velocities averaging 12 miles per hour and the mechanized equipment necessary to operate the mine, dust problems will exist in varying degrees throughout the life of the project.

Construction of the pipeline will result in disturbance of approximately 250 acres of right-of-way lands. A certain amount of erosion hazard will exist for a period of time even though intensive reclamation and rehabilitation measures are adopted.

The scenic quality of the face of White Mountain will unavoidably be imparied by a scar approximately 50 feet wide and two miles long. This face is readily observed from the Rock Springs-Green River vicinity. Duration of the impact is not easily predicted. Re-establishment of similar vegetation may screen the scar within a two to five year period. Conversely, exposure of different colored subsoils may make the disturbance of relatively permanent feature of the landscape.

Installation of the transmission lines will cause some unavoidable intrusion on the aesthetic values of the area. Since the lines pass through open range and woodlands most of their distance, points of impact to significant numbers of people are limited. The lines will cross three highways which are major routes to Yellowstone Park from the south. Combined average daily summer traffic on these three highways is approximately 3,200 vehicles per day. This impact could be avoided by use of underground cable, if and when a technique is feasible and practical. The lines will also cross the valleys of the Hams Fork and Bear Rivers. There will be some unavoidable impact to the inherent scenic quality of this area even though extensive effort at line relocation has been made to reduce visibility of the lines.

There will be some disruption to wildlife species in the vicinity of the coal mine and the generation plant during the life of the project. This will also be true in other areas during the construction stage. Access, service and maintenance roads could result in harassment of big game animals and domestic livestock by off-road vehicles unless management and control is exercised during critical periods of the year. The proposed transmission lines traverse approximately 75 miles of big game winter habitat area.

The transmission lines also pose a threat to bird life. Despite tower design and careful spacing of conductors, some bird mortality will occur as a result of flying into guy wires, towers and conductors during periods of adverse weather conditions and poor visibility.

VIII

SHORT TERM USE vs LONG TERM PRODUCTIVITY

VIII SHORT-TERM USE vs. LONG-TERM PRODUCTIVITY

Most of the environmental effects are expected to be limited to the life of the power plant. However, as pointed out in the discussion on emissions, there could be long-term effects from the plant emissions causing changes in land use patterns which may continue indefinitely. The risk in ecological damage sufficient to change land use is judged to be very slight.

The life of the power plant may be the 35-year life of the presently defined coal field or it could be lengthened significantly by mining coal of equal quality at greater depths on other portions of the leases held by the Companies. The plant life might also be lengthened by purchase of coal within economic hauling distance. On the other hand, the life of the power plant could be shortened by as much as 15 to 20 years if alternative sources, such as nuclear, prove to be sufficiently economical and available.

The life of the transmission line corridor will probably continue almost indefinitely. It has been identified as a favorable route for an extra high voltage intertie between the Pacific Northwest and the Midwest.

Since the water used by the Project will not return to the Green River the increase in salinity in the upper reaches is nil. The projected increase at Hoover Dam by virtue of withdrawing this 30,000 acre feet is in the range of 2 ppm.

Long-range benefits will occur as a direct result of the jobs created and the increased tax base realized from the capital improvements and energy produced.

Possible synergistic effects are discussed in Chapter VE. titled "Cumulative Impacts." However, it is not anticipated that such effects would continue more than a few years beyond the life of the power plant, with one exception. The carbon dioxide from the plant's stack emissions together with the CO_2 from other sources will remain in the atmosphere and the seas indefinitely. It is removed by natural processes but only over a period of millions of years. There is no known feasible methods of speeding up the removal process.

If the power plant should operate at full capacity for 35 years, it would exhaust into the atmosphere about 450 million tons of carbon dioxide. This is about .018% of the estimated 2,333 billion metric tons in the global atmosphere in 1950.1/ The total for the 35 years would amount to about 5% of the total global output from man's activities in one year during the 1960's. It is of significance only as a small increment in the total world output. One possible effect from cumulative increases in global CO_2 levels is discussed in section V.A.1.

1/ The President's Science Advisory Committee, Report of the Environmental Pollution Panel, U. S. Government Printing Office, 1965.

IX

IRREVERSIBLE AND IRRETRIEVABLE COMMITEMENT OF RESOURCES

IX. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The generation plant is expected to consume 100 to 150 million tons of coal over the active life of the project. Sand, gravel and other construction material used in construction of the generation plant, pumping station, surge pond dam, and as surfacing material constitute a one-time use considered to be irretrievable from the practical standpoint. The Companies' water rights permit the diversion of almost 30,000 acre feet of water from the Green River annually for use at the generation plant. Though lost for other downstream use or application, it is a renewable resource and is returned to the climatic and hydrologic cycle. The use of land for the generation plant and other facilities is committed to the life of the project. At such time as the facilities are abandoned, the land will again be available for other uses as conditions then dictate.

The area of the generation plant, surge pond and evaporation ponds is lost to use of forage and habitat by domestic livestock, upland birds, big game and some smaller species indefinitely. There is some tradeoff to be expected however. The surge pond and evaporation ponds will no doubt attract aquatic oriented species.

X

ALTERNATIVES TO THE PROPOSAL

X. ALTERNATIVES TO THE PROPOSAL

A. OTHER SOURCES OF ELECTRIC POWER

The schedule for the Jim Bridger plant adopted by the Joint Power Planning Council has been advanced to compensate for the delay in construction of a proposed nuclear plant near Eugene, Oregon, because of environmental issues. It provides that all three 500 MW generating units of Jim Bridger be operative by 1976. Because five years or more are needed to locate and design power plants and associated transmission lines of this magnitude, with at least five more years for construction, no alternatives are available if the time schedules are to be met. The Companies expect to complete construction of all three generating units by September 1976.

1. Delay or nonconstruction alternative

One alternative would be to attempt to locate alternative sources of power and delay the construction of the Jim Bridger plant in the interim. Another would be not to construct the Jim Bridger plant and make no attempt to satisfy the projected power needs. Either alternative would have the effect of slowing down Pacific Northwest economic growth, at least between 1970-1980. BLM concurs with the Office of Science and Technology as they discuss the issue in the following terms:[1]

> "The Rate of Growth in Demand
>
> "1. The rapid growth in demand for electricity, energy and materials generally will continue to exacerbate the environmental problems even though part of the growth will be needed to utilize electricity for uses such as sewage treatment plants, rapid transit systems, and recycling wastes which affect major improvements in the quality of the environment.

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[1] The Energy Policy Staff, Office of Science and Technology, Electric Power and the Environment. August 1970.

> The issue is often raised: 'Is this plant really needed?' But the basic question of whether electricity use is growing too rapidly cannot be answered on an individual plant basis. It is but part of the much larger and fundamental question of the pattern of growth of the Nation's future. An answer requires a broad examination of the significance of all forms of energy to the economy and the public welfare, including analysis of the form and amount of energy that would be used if the projected increases in electricity consumption were materially curtailed. It would also involve an examination of pricing policies, rate structures, advertising programs, tax policies, and other factors in the economy affecting growth.
>
> "2. The relative costs and benefits of present policies as contrasted with a policy of discouraging growth in energy use examine all of the basic factors that shape the present rapid rate of energy growth in the light of our resource base and the impact of growth on the environment. We raise the issue here for further study and discussion."

2. Hydroelectric alternative (after 1976)[2/]

With exception of the middle Snake River, the Salmon River, the Clearwater River, and the middle Columbia River (Hanford-Wenatchee section), all potential sites for major main stem hydroelectric projects in the Pacific Northwest have been or are being developed. All four rivers or river segments are presently free flowing. Public sentiment against dams and in favor of dedicating all these rivers as free flowing is very strong. Although undeveloped hydro potential does exist on lesser tributaries of the Columbia, such as the Wenatchee, Snoqualmie, upper Snake, Flathead, and Kootenai, the power output would be small in comparison to the Jim Bridger Plant.

2/ Pacific Northwest River Basins Commission, Columbia-North Pacific Region Comprehensive Framework Study, Appendix XV Electric Power. 1970. Also Joint Power Planning Council, 20-Year Hydro-Thermal Program.

One long-range possibility may be the purchase of additional hydroelectric power from Canada. This alternative would be subject to several complications. The most significant of these is the present Canadian policies which bars power exports except for interchange agreements and in emergency situations. Even if this obstacle should be overcome, there remains the problem that hydroelectric resources in Canada are subject to the same environmental pressures as similar projects in the United States; their development for export probably would encounter even stronger opposition.

3. Nuclear alternative (after 1976)

In the long run nuclear power plants may conclusively prove their superiority over fossil fuel plants. This is not yet an accomplished fact from either an economic or an environmental standpoint. The merits and demerits of nuclear plants have been widely discussed and need not be repeated here. The relative advantages of nuclear vs. coal-fired thermal plants often vary with geographic location.

Leadtime for the studies, design, environmental analysis, and construction of a nuclear plant approaches 10 years. Therefore, if short-term power demands are to be met, nuclear generation does not appear to be a feasible alternative for Jim Bridger. If, however, the alternative were viable at this time it would also involve environmental impacts of a different nature but similar magnitude.

4. Geothermal alternative (after 1976)

The potential for power production from geothermal sources in the Pacific Northwest is unknown. Exploration began on a modest basis in 1971. It will take decades for the necessary exploratory work to be completed and the techniques for power generation from this source to be perfected for Northwest conditions. The economics of this method of power production in the Pacific Northwest are very uncertain.

Speculation by a representative of the Oregon State Department of Geology and Mineral Industries concerning the amount of geothermal power that may eventually be developed in the Pacific Northwest indicated a range from near zero to 30,000 MW.

5. Oil and gas alternative

The following table prepared from information published in the Minerals Yearbook[3/] illustrates the relative availability of crude petroleum, natural gas and coal in the vicinity of Jim Bridger operations and Alaska.

	Production Crude Petroleum (000 42-gallon barrels)		Bituminous Coal (000 short tons)		Marketed Natural Gas (million cu. ft.)	
	1968	1969	1968	1969	1968	1969
Alaska	66,204	73,953	750	667	17,343	50,864
Idaho	None Reported		None Reported		None Reported	
Oregon	"	"	"	"	"	"
Utah	23,504	23,295	4,316	4,657	46,151	46,733
Wash.	None Reported		None	58	None Reported	
Wyo.	144,250	154,945	3,829	4,602	248,481	303,517

Natural gas and petroleum products are in relative short supply and committed economically to transportation, heating, and other industrial uses. According to the Bureau of Mines (see full context of comments in XI D), proven petroleum reserves in Wyoming at the end of 1970 included about 1 billion barrels of crude oil and 4.2 trillion cubic feet of natural gas. In 1970 the State produced 160.3 million barrels of crude oil and 362.8 billion cubic feet of natural gas. While Wyoming's production is sizeable, it is evident

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[3/] Minerals Yearbook, Vol. III, Area Reports: Domestic. U. S. Dept of the Interior, 1969.

that other States must import these products to meet their needs. Cost and reliability would preclude their use for firing an electric generation plant. Coal reserves are also sizeable (see Figure 1 and Table 1) and can be used for power generation with a minimum of processing. If oil or gas were used for power generation, then the coal would have to be processed to fill the void in other segments of the economy. At the present time it is not economically feasible to convert coal for this purpose on a scale of this magnitude. On the basis of BTU requirements to fire the three units at Jim Bridger, which will consume an estimated 750 tons of coal per hour (producing 10,000 BTU's per pound), natural gas would be consumed at the rate of 421 million cubic feet per day (assuming the standard 855 BTU's per cubic foot), or more than one-half of the average daily marketed production in Wyoming in 1969.

While crude petroleum and natural gas production in the Pacific Northwest is nil, there is an extensive refining industry in the Puget Sound area supplied by Canadian crude. There is also the possibility of using Alaskan oil and gas, although this is some time in the future, probably a minimum of five years. It appears we are nearing the limit of our ability to supply oil and gas requirements from known reserves and more effective use of our seemingly abundant coal reserves will be necessary if we are to meet future energy requirements at an economically acceptable level.4/

The oil and gas fields and pipelines of Wyoming as of January 1, 1971, are shown on Map #2.

4/ Information from Office of Oil and Gas. See comments in XI D.

B. ALTERNATIVE GENERATING PLANT LOCATIONS

The following alternatives were explored by the Companies before deciding to share the Jim Bridger facility:

1. Idaho location

Idaho Power Company considered building their own plant at a site near American Falls, Idaho, on the Snake River. If this alternative were followed, the result would be two, somewhat smaller plants -- one for each company. The Bureau of Reclamation has this to say about local dispersion of smaller plants --

> "Single plant construction is preferable to multiplant because of economic considerations. Control of flue gas emissions from a large plant will likely attain slightly better efficiency and lower unit costs than the accumulated efficiency of two or more smaller plants with the same total capacity . . .
>
> "The economy of improved air pollution equipment for air contaminants, such as SO_2, might be better at one large plant. The installation of many small plants would require significant increases in right-of-way requirements for transmission lines, access roads, coal hauling routes, plant sites and substations, and ash disposal areas."5/

2. Green River location

The power companies also considered the possibility of locating the plant site adjacent to the Green River. This proposed alternative would have necessitated transporting the coal from the Pacific Power & Light Company mine to the plant site, a distance of 42+ miles, by rail, truck, or a slurry method utilizing an underground pipeline. The study of this proposal indicated several environmental and economic problems. Pollution of the Green River by the potential discharge of warm or contaminated boiler, blowdown or coolant waters could be expected. The

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5/ Bureau of Reclamation, Study of Environmental Factors, San Juan Generating Station, May 1971.

SOURCE: STRIPPABLE COAL RESERVES OF WYOMING, PRELIMINARY REPORT 181, DECEMBER 1970. U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF MINES.

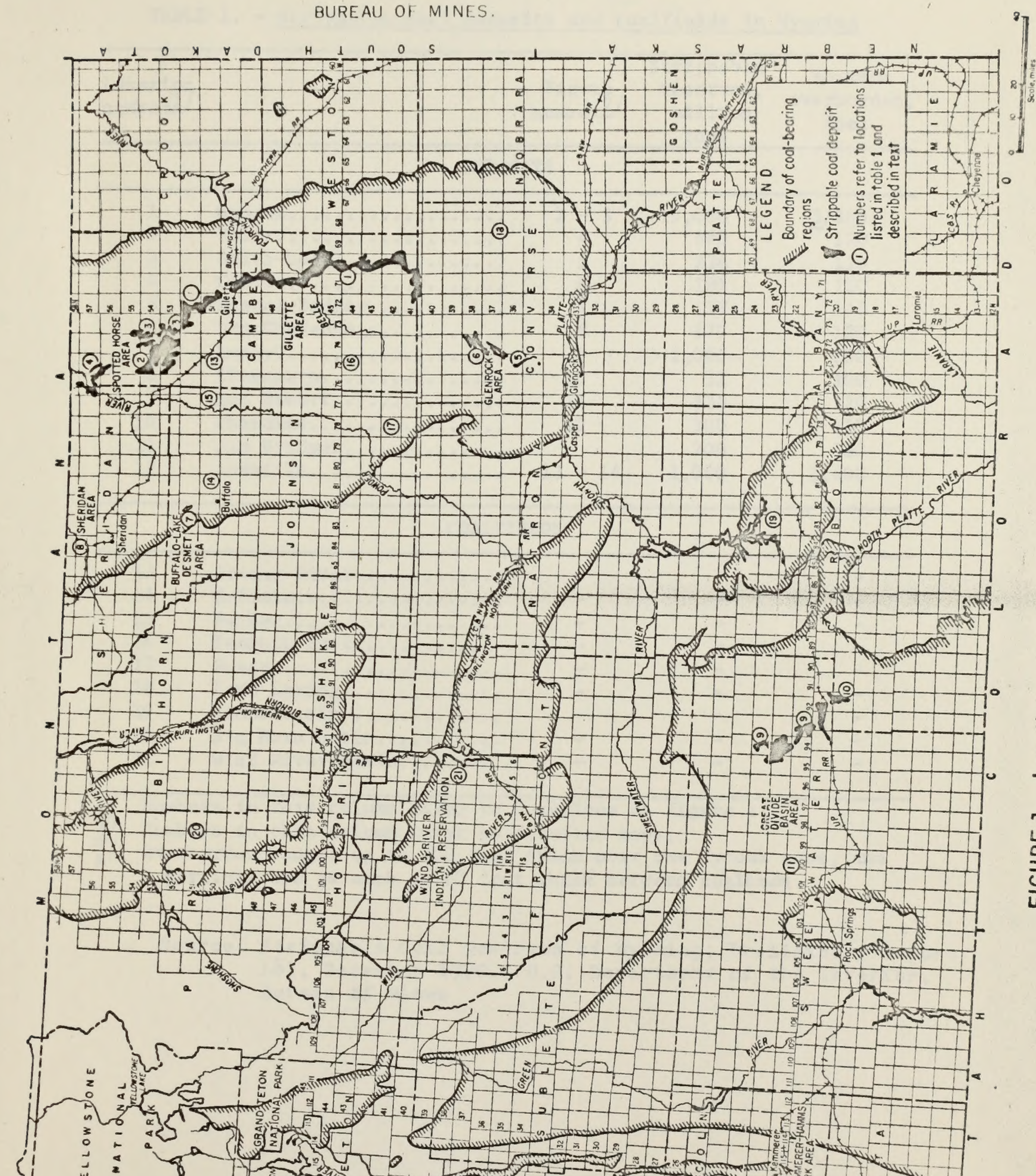

FIGURE 1.-Locations of strippable coal in Wyoming.

TABLE 1. - Strippable coal deposits and coalfields in Wyoming

Location number[1]		Figure number[2]	Strippable reserves, million tons	Maximum overburden, feet
	DEPOSITS			
1	Wyodak....................	2 - 3	19,000	[3]260
2	Felix.....................	4	480	120
3	Smith-Local...............	5	236	120
4	Canyon....................	6	185	120
5	School-Badger.............	7	137	140
6	Dry Cheyenne..............	8	179	120
7	Healy.....................	9	1,000	200
8	Kleenburn.................	10	32	100
9	Red Desert................	11	733	120
10	Cherokee..................	12	200	120
11	Jim Bridger...............		200	120
12	Adaville..................	13 - 14	1,000	1,400
	COALFIELDS			
13	Powder River..............	-	-	-
14	Buffalo...................	-	-	-
15	Barber....................	-	-	-
16	Pumpkin Butte.............	-	-	-
17	Sussex....................	-	-	-
18	Lost Spring...............	-	-	-
19	Hanna basin...............	-	-	-
20	Big Horn basin............	-	-	-
21	Wind River basin..........	-	-	-

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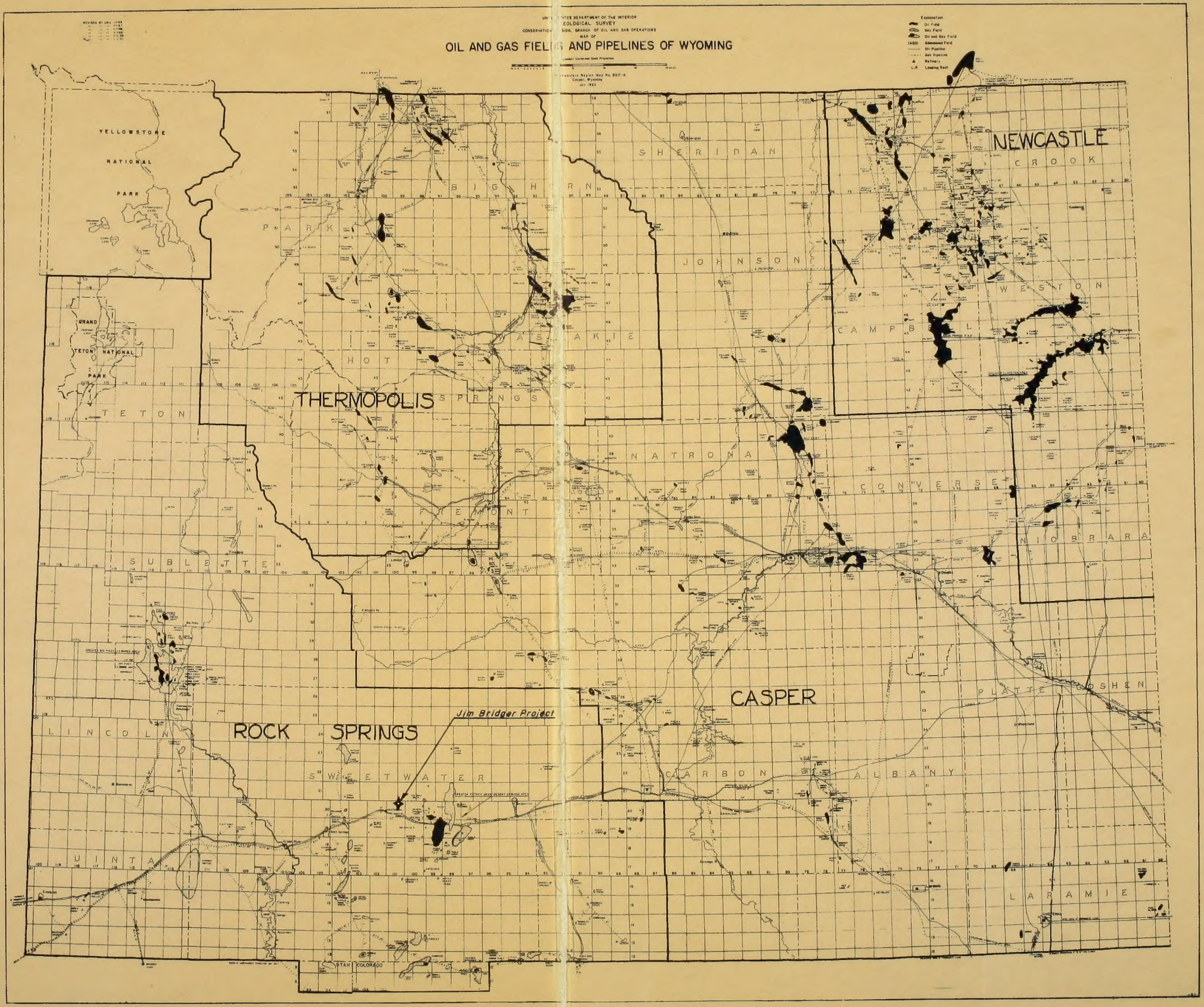
[1] Numbers in this column refer to locations on figure 1.

[2] Numbers in this column refer to detailed maps.

[3] Overburden ranges up to 200 feet thick over the Wyodak zone, and partings are as much as 60 feet thick between coalbeds.

Source: Strippable Coal Reserves of Wyoming, Preliminary Report 181, December 1970. U.S. Department of the Interior, Bureau of Mines


UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CONSERVATION DIVISION, BRANCH OF OIL AND GAS OPERATIONS
MAP OF
OIL AND GAS FIELDS AND PIPELINES OF WYOMING
Casper, Wyoming
Explanation
Oil Field
Gas Field
Oil and Gas Field
(ABD) Abandoned Field
Oil Pipeline
Gas Pipeline
Refinery
L.R. Loading Rack
YELLOWSTONE NATIONAL PARK
GRAND TETON NATIONAL PARK
PARK
BIG HORN
SHERIDAN
JOHNSON
NEWCASTLE
CROOK
WESTON
CAMPBELL
WASHAKIE
HOT SPRINGS
THERMOPOLIS
TETON
NATRONA
CONVERSE
NIOBRARA
FREMONT
SUBLETTE
LINCOLN
ROCK SPRINGS
Jim Bridger Project
SWEETWATER
CARBON
CASPER
ALBANY
PLATTE
GOSHEN
UINTA
LARAMIE
UTAH
COLORADO

Map 2

disposal of fly ash, residues and other contaminants would be a major problem whereas if the generating plant were located at the mine site, the subject materials could be disposed of beneath the reclaimed or mined-out portions of the stripping operation. A plant site along the river would reduce valuable shoreline available for other potential uses. In addition, the plant complex, including access road, rail spurs, coal stock piles and other related needs, would have created very questionable aesthetic conditions in this more populated and visited area. Economically, the cost of transporting the generally low heat input coal (7,000-9,000 BTUs) to a plant site along the Green River would also, according to company data, cost considerably more than transporting water to a plant site located near the mine area.

3. Other locations

If the plant were located in a metropolitan area, there would be an increase in the per capita influence of pollutants and/or visual awareness, even if the pollutants and visual aspects were kept to a minimum standard. The location of this plant in a remote area has the advantage of reducing the congestion and impacts in any major load and population center where the plant might otherwise be placed. However, substantial transmission losses are incurred in sending the power from a remote area to a population center. The location of the proposed generating facility in some other remote area would probably not significantly alter potential environmental effects.

C. ALTERNATIVE REGIONAL LOCATIONS FOR TRANSMISSION LINES

The guidelines adopted by the Departments of the Interior and Agriculture and included in the 1970 publication "Environmental Criteria for Electric Transmission Systems" emphasize the need for long-range land use planning, the extensive use of utility corridors, and coordination of industry and government beginning early in the planning stages. The Office of Science and Technology in its 1970 publication "Electric Power and the Environment" makes similar recommendations.

The general location of Interstate 80 and the Union Pacific Railroad across southern Wyoming and Idaho offers one of the most favorable transportation corridors for crossing the Rockies and other mountainous terrain to the Pacific Northwest. A route roughly paralleling Interstate 80 and the railroad also offers one of the most favorable locations, from both the environmental and economic point of view, for a high voltage power intertie between the Pacific Northwest and the Midwest power systems. The Pacific Power & Light Company-Idaho Power Company route through southwestern Wyoming and southeastern Idaho in combination with similar high voltage transmission via Montana appears to offer the best westward transmission routing for power from future power plants which may utilize the estimated 23 billion tons of strippable coal reserves of Wyoming.[6]

The specific location sought by Pacific Power & Light Company and Idaho Power Company for the three parallel 345 kv lines through southwestern Wyoming and part of southeastern Idaho also appears to be the

---

6/ USDI, Bureau of Mines, Strippable Coal Reserves of Wyoming, Preliminary Report 181, December 1970.

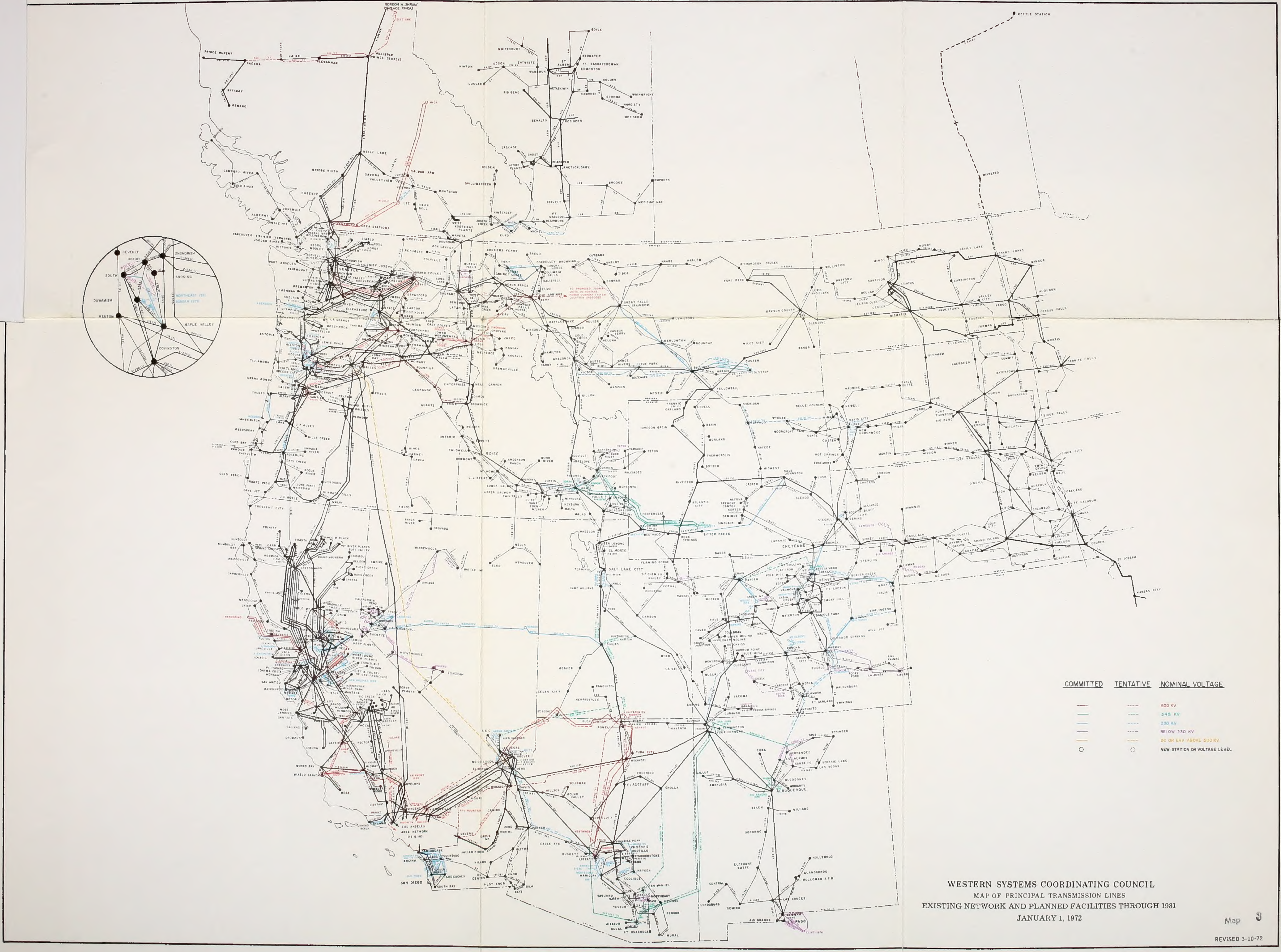
best potential location for any additional transmission line capacity through that area. The Power Planning appendix for the Columbia-North Pacific Framework Plan anticipates the need for one extra high capacity intertie through southern Wyoming and one through Anaconda, Montana, by 1990 (p. 142 and fig. 19). The principal transmission lines, existing network and planned facilities for the Western States through 1981, as depicted by the Western Systems Coordinating Council, are shown on Map #3.

1. Alternative transmission line voltage

A logical alternative to the three 345 kv lines would be a system with two 500 kv lines. Since the Companies estimate a system utilizing two 500 kv lines would cost in the order of 60% (approximately $40,000,000) more than the proposed 345 kv system, considerable additional benefits would be required to justify utilizing 500 kv. An analysis, was made of the benefits of future transmission requirements, right-of-way requirements and reliability. It was concluded that the selection of a 345 kv transmission system utilizing single circuit lines had the following advantages:

1. Reaiability would be superior to the alternatives studied.
2. Right-of-way requirements are essentially the same as for a 500 kv system (see Tables 2, 3 & 4).
3. $40,000,000 saving over a 500 kv transmission system.
4. Deferred capital expenditures as each 345 kv line is timed to match the installation of each generating unit (Table 5).
5. Future integration of other 345 kv transmission systems and upgrading of existing 230 kv lines is possible.
6. Greater flexibility in serving existing load centers without added transmission and in serving new load centers should they develop.
7. Integration with future EHV interregional transmission is equally as good at 345 kv as at 500 kv.

Should greater line capacity be required in the future, these lines could be upgraded to an appropriate higher voltage depending on the circumstances at that time. To do so would require adequate right-of-way for a fourth line, which would be constructed and in service before the older line or lines were de-energized for rebuilding. This fourth line could be an extra high capacity intertie. Future upgrading could also include undergrounding if it becomes feasible.



WESTERN SYSTEMS COORDINATING COUNCIL

MAP OF PRINCIPAL TRANSMISSION LINES

EXISTING NETWORK AND PLANNED FACILITIES THROUGH 1981

JANUARY 1, 1972

Map 3

REVISED 3-10-72

JIM BRIDGER TRANSMISSION
RIGHT OF WAY REQUIREMENTS
345 KV Vs. 500 KV

	RIGHT OF WAY REQUIREMENT			
	500 Kv		345 Kv	
	Miles	Acres	Miles	Acres
Transmission Requirements for Three Unit Operations at Jim Bridger.				
2-500 Kv Common Right of Way	237	8620	-	-
3-345 Kv Common Right of Way	-	-	149	6140
2-345 Kv Common Right of Way	-	-	55	1570
1-345 Kv	-	-	177	2790
1-230 Kv	61	920	21	320
Total Project R/W	298	9540	402	10,820
Additional 230 Kv Circuit to Goshen by 1980 Required to Meet Load Growth				
1-230 Kv (Goshen-Borah)	65	980	-	-
Minimum Right of Way Requirement Through 1980.	363	10,520	402	10,820

TABLE 2

DEM - 10-12-70

JIM BRIDGER PROJECT
PROPOSED 345 KV TRANSMISSION PLAN
RIGHT OF WAY REQUIREMENTS

Route	Lines	Length Miles	Width Feet	Acres/ Mile	Total Acres
Jim Bridger- Point "A"	3-345 kv	149	340	41.21	6140
Point "A" - Point "B"	2-345 kv	55	235	28.48	1570
Point "A" - Goshen	1-345 kv	77	130	15.74)	2790
Point "B" - Borah	1-345 kv	33	130	15.74)	
Point "B" - Kinport	1-345 kv	27	130	15.74)	
Goshen - Kinport	1-345 kv	40	130	15.74)	
Naughton Tap Line	1-230 kv	13	125	15.16)	320
Jim Bridger Tap Line	1-230 kv	.8	125	15.16)	
Total R/W Requirement					10820

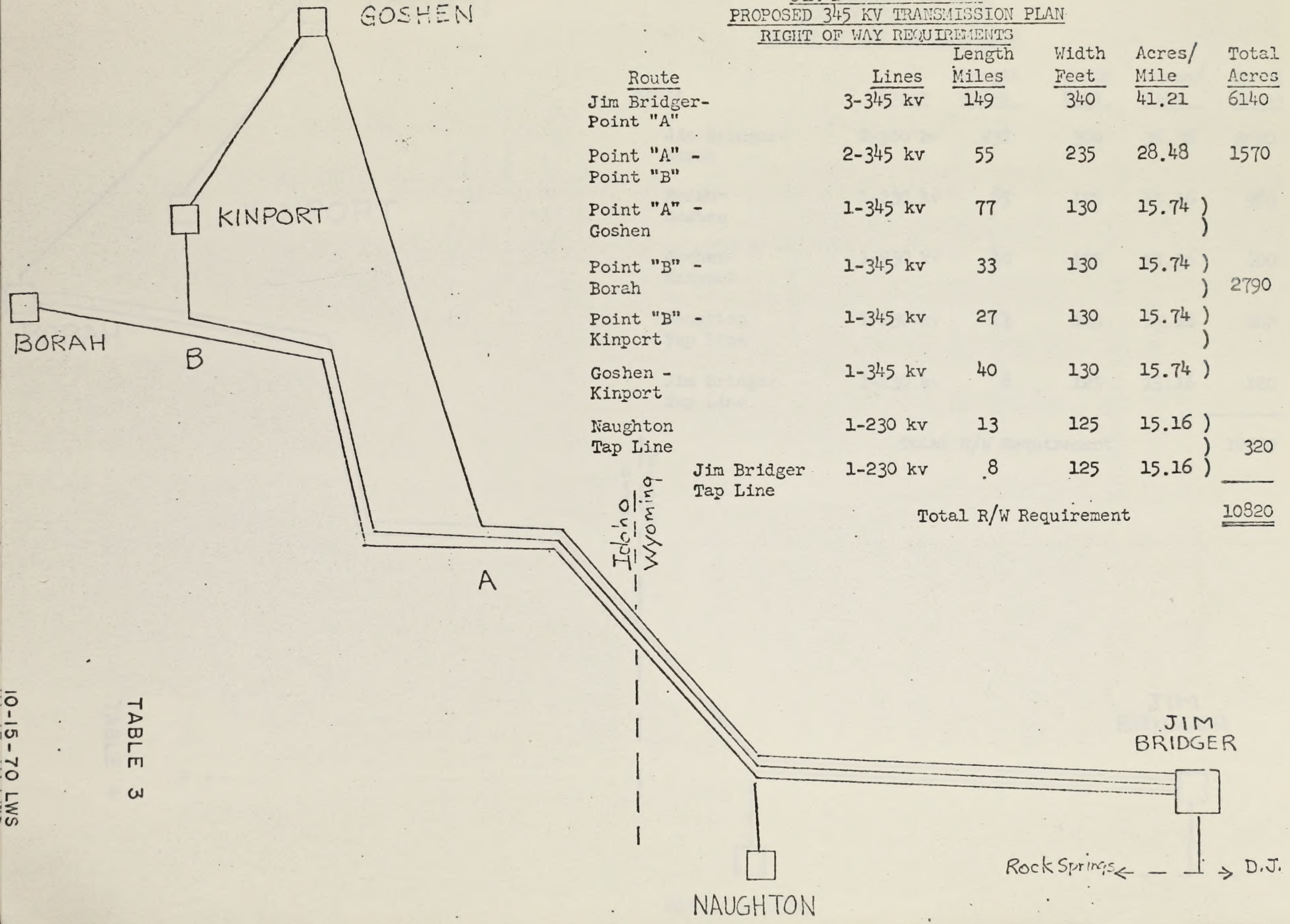


TABLE 3

10-15-70 LWS

JIM BRIDGER PROJECT
500 KV TRANSMISSION
RIGHT OF WAY REQUIREMENTS

Route	Lines	Length Miles	Width Feet	Acres/ Mile	Total Acres
Jim Bridger-Borah	2-500 kv	237	300	36.36	8620
Borah-Goshen	1-230 kv	65	125	15.16	980
Goshen-Kinport	1-230 kv	40	125	15.16	600
Naughton Tap Line	1-230 kv	13	125	15.16	200
Jim Bridger Tap Line	1-230 kv	8	125	15.16	120
Total R/W Requirement					10520

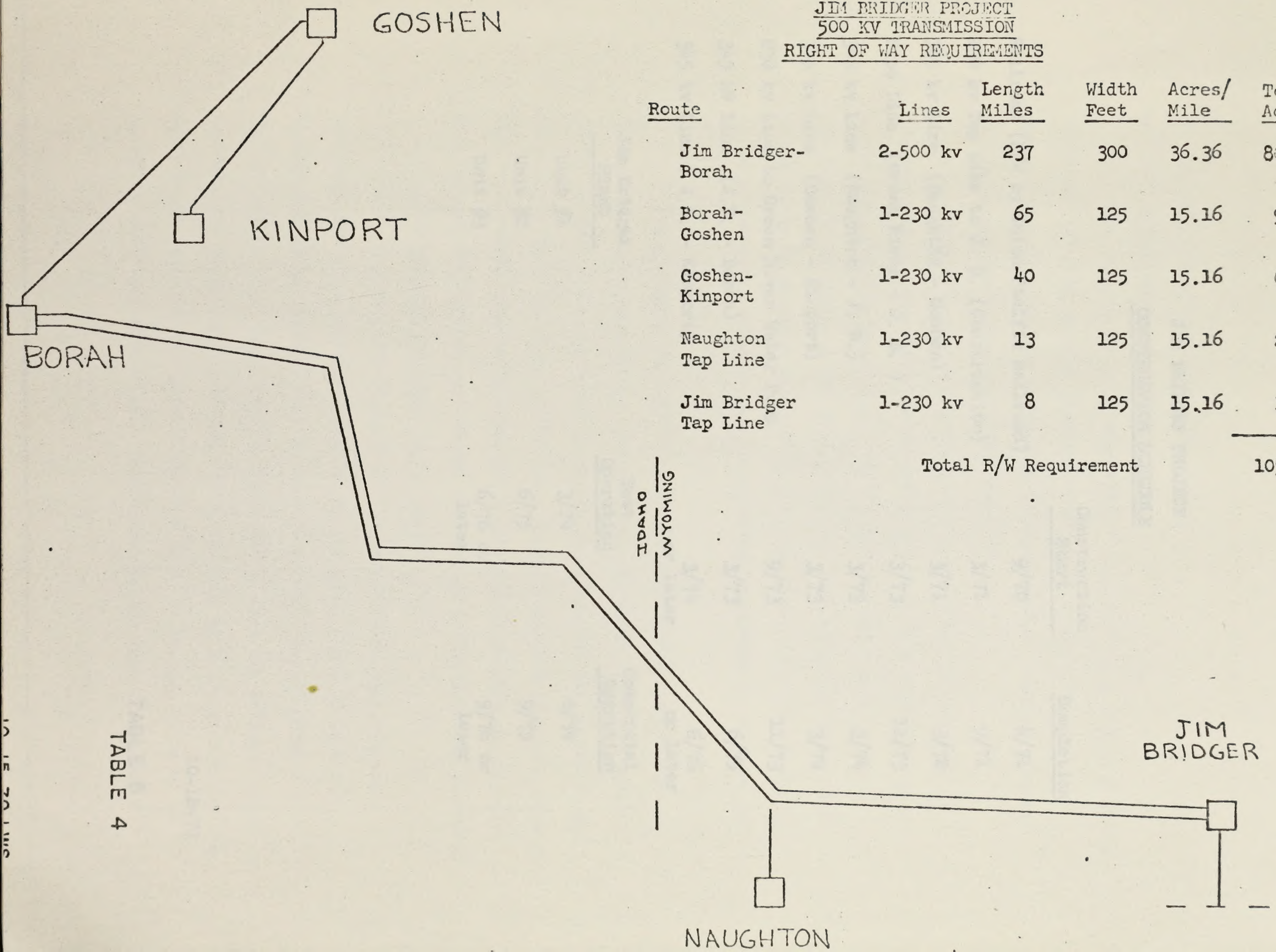


TABLE 4

JIM BRIDGER PROJECT

CONSTRUCTION SCHEDULE

	Construction Start	Completion
Railroad (R/W by Union Pacific Railroad)	9/70	4/71
230 kv Tap Line to J. B. (Construction)	3/71	9/71
345 kv Line (Naughton - Goshen)	3/71	3/72
Pipe Line (Green River - J. B.)	3/73	11/73
345 kv Line (Naughton - J. B.)	3/73	3/74
345 kv Line (Goshen - Kinport)	3/73	3/74
230 kv Line to Green River Water Pump	9/73	11/73
345 kv Line (J.B. - Borah)	3/73	6/75
345 kv Line (J.B. - Kinport)	3/74 or later	6/76 or later

Jim Bridger Plant	Test Operation	Commercial Operation
Unit #1	3/74	6/74
Unit #2	6/75	9/75
Unit #3	6/76 or later	9/76 or later

10-12-70

TABLE 5

2. Alternative transmission line routing

a. Relationship of existing lines

The utilization of transmission "corridors" is a widely accepted technique in power project planning to minimize adverse impacts. In theory, several lines are restricted to one suitable location, thereby confining impacts to the one linear area.

Exhibit 1 shows major transmission lines now in operation in the proposed project area. These existing routes were evaluated as to suitability for corridors, e.g., the suitability for combining the proposed 345 kv lines of the Bridger Project with existing line routes. Two sections of existing 161 and 230 kv lines were identified as being suitable corridor routes -- these are further explained in sections (1) and (2) which follow.

The remainder of existing line routes, however, are poorly located by today's standards. The addition of 345 kv lines and metal towers to poor locations would intensify existing land-use conflicts and increase adverse impact on aesthetics. It was concluded from this analysis that a desirable long-range objective would be to dismantle and abandon most 161 and 230 kv line sections as they become technologically outmoded.

(1) Lava Hot Springs - Arimo Area

A subsequent analysis of the transmission line routing indicated there was possible conflict at the small towns of Lava Hot Springs and Arimo, Idaho. This segment is shown as A-1 on Exhibit 1. The two 345 kv lines would pass to the south of Lava Hot Springs, which has definite potential for growth and development as a tourism-recreation center. The most logical growth area for this use appears to be up the valley to the south of the town. The transmission right-of-way would pose a constraint to such development. The same lines, as proposed, would pass very near the small town of Arimo. While no specific conflict was identified, it appeared desirable not to have this large line very near to urban land uses.

Alternative location A-2 was identified in an attempt to avoid these possible conflicts. One other advantage of A-2 is that it utilizes approximately 20 miles of suitable and existing 230 kv corridor. Construction costs appear to be similar. One disadvantage identified with A-2 is that it would traverse approximately two more miles of dry farm agricultural land than A-1. The Companies, USFS, Idaho Public Land Department and BLM have tentatively agreed on A-2 as the preferred route.

(a) Blackfoot River Area

Comment received on the draft environmental statement suggested that proposed 345 kv line routing along the Blackfoot River in Idaho be further evaluated in terms of alternative routes. This segment is labeled B-1 on Exhibit 1.

The route, as originally proposed by the Companies, posed a conflict with the historic Lander Trail. An alternative route $1\frac{1}{2}$ to 2 miles west of the Lander Trail area was identified to eliminate this conflict. This route was evaluated and accepted by the Companies.

Even with this relocation adjustment, the line appears to conflict with scenic values of the Blackfoot River area for a distance of approximately five miles south after crossing the river. The proposed line would pass through rolling hills $\frac{1}{4}$ to $1\frac{1}{4}$ miles from the Blackfoot River. The lines would be visible from several points on the river and generally from the road which traverses the area on a bench above the river itself. The river corridor has moderate aesthetic quality, and recreational use is quite important to the Pocatello-Blackfoot-Idaho Falls communities. Fishing use of this five-mile segment is estimated by the Idaho Fish and Game Department to be approximately 2,000 fisherman days annually. The County Road Department estimates an average of 50 cars per day passing through the area (Monday through Friday) during summer months. Weekend use of the road could be expected to be significantly higher. Analysis of this situation indicates alternative route B-2, as shown on Exhibit 1, would have certain environmental advantages because of distance from the river and because it would utilize approximately 20 miles of existing 161 kv route which appears to be suitable for use as a corridor. The route would, however, cross headwaters of the Portneuf River and adversely impact aesthetics there. Detailed feasibility of this route is not known at present. This route and other mitigating techniques, such as minor relocation of Route B-1, special tower design, access road location, etc., should be examined closely to insure desirability of the final location and design.

b. Split corridors

Splitting the powerline corridor at Montpelier into the two proposed routes -- one going to Goshen and thence to Kinport, and the other going directly to Kinport deserves explanation. The Companies' analysis is presented below:

> "To understand the reasons for this preferred routing, it is necessary to consider the overall long range bulk power transmission needs of the Upper Snake River Region, as well as the need to deliver power from the Jim Bridger Plant to Idaho and points west.
>
> "One of the prime objectives served by the routing of the Jim Bridger 345 kv transmission lines is that together with the existing system they will provide the necessary reliable service for many years to come to the Upper Snake River Valley area. This growing area, which includes the centers of Pocatello and Idaho Falls, has a present population of approximately

> 180,000 persons and an electric power load of nearly 800 megawatts, an amount which equals over half the projected output of the Jim Bridger Plant. This load is served through the substations of Borah, Kinport, and Goshen, which comprise the western terminals of the 345 kv Jim Bridger transmission lines. Increasing load of the area and reliability requirements dictate that each of these three load centers be served by at least two high capacity lines such as the Bridger 345 kv lines or existing lines providing their capacities are adequate and locations are suitable. One existing line, effectively from Borah to Kinport, is a double circuit 138 kv line which will be uprated to 230 kv to serve this purpose.
>
> "At least two plans for serving the Goshen load center in lieu of routing one Jim Bridger 345 kv line from Bridger through Goshen to Kinport have been considered and discarded because of greater cost, poorer reliability, limited future load service capability, unnecessary line construction or combinations of these reasons.
>
> "One of these plans would avoid the 345 kv transmission route from Montpelier to Goshen but would require instead an additional 345 kv circuit from Montpelier to Kinport to Goshen. In addition to requiring nearly 40 miles more of 345 kv line construction at an extra cost of $2 million more than the companies' preferred plan, it would require additional rights-of-way for two circuits rather than one through the Fort Hall Indian Reservation and the populated areas between Kinport and Goshen. The reliability of service to Goshen and the rest of the system would suffer because of concentration of an additional 137 miles of line onto a common line corridor.
>
> "A second scheme, which was seriously considered prior to the development of the Jim Bridger Plan, required a 230 kv line from Naughton Plant to Goshen and thence to Kinport following essentially the same route as the planned 345 kv line. This scheme would avoid 345 kv line to Goshen but still would require three 345 kv lines from Bridger to Kinport and Borah. It would not have any less mileage of transmission corridors than the preferred plan but would involve 141 miles more line construction, $4.5 million more cost, and would have less than half the load service capability to the Goshen load center."

The split corridor seems justified for both reliability of service and for economic reasons.

c. Reference to mineral resources

The route selection of the three 345 kv lines from the Jim Bridger Power Plant site to their terminal points in eastern Idaho, as well as the 345 kv tie-line from the Goshen to Kinport station and the temporary 230 kv line from the Naughton Power Plant to the main line, was based in part on known locations of mineral resources. Also taken into account were areas where mineral resource development has occurred and had been abandoned for some unknown reason.

No attempt was made to determine or to anticipate areas where drilling or other types of exploratory work might occur on a purely speculative basis.

Reference to Figure 1 and Map 2 gives an indication of the complexity of the mineral estate in western Wyoming. The recognized oil shale province also blankets a large portion of southwestern Wyoming, and trona beds are prevalent in the area immediately south and west of the Seedskadee Wildlife Refuge. The portion of Idaho traversed by the transmission lines is relatively free of oil, gas and commercial minerals, other than potash and phosphate deposits in the American Falls and Pocatello areas.

XI

CONSULTATION AND COORDINATION

XI. CONSULTATION AND COORDINATION

A. Consultation Prior to draft Statement

A series of meetings were held with representatives of Federal, State and local agencies and with other interested parties to discuss environmental aspects of the Jim Bridger complex prior to draft Statement preparation.

The first meeting was held at Kemmerer, Wyoming on September 2, 1970, and was attended only by agency personnel from BSF&W, Bureau of Reclamation and BLM. A second meeting was held in Boise, Idaho on September 22, 1970, at which time the power outlined the parameters of the Jim Bridger complex for the land administering agencies. The third meeting took place on October 8 & 9, 1970, when the power companies conducted an aerial tour and on-the-ground inspection of the proposed project in Wyoming and Idaho for all interested parties in Wyoming. A similar meeting and examination of proposed facilities was conducted for Idaho people October 21 & 22, 1970. On October 27, 1970, a fifth meeting was held in Cheyenne with Company officials to discuss reclamation and rehabilitation of open pit mining operations. A sixth meeting was held in Green River, Wyoming May 20, 1971, to examine and resolve possible alternatives for crossing the Green River in the vicinity of the Seedskadee Wildlife Refuge. Idaho Public Utilities conducted a public hearing on the Jim Bridger applications at Soda Springs, Idaho on July 19, 1971. In addition, meetings have been held with several local parties to appraise them of this project.

Following is a listing of Federal, State and local agencies who were consulted or were in attendance at meetings in connection with environmental aspects of the Jim Bridger complex:

Federal Agencies

- Bureau of Reclamation, Salt Lake City, Utah*
- Bureau of Reclamation, Cheyenne, Wyoming
- Bureau of Reclamation, Boise, Idaho
- Bureau of Sport Fisheries & Wildlife, Albuquerque, New Mexico
- Bureau of Sprot Fisheries & Wildlife, Green River, Wyoming*
- Bureau of Sport Fisheries & Wildlife, Salt Lake City, Utah
- Bureau of Indian Affairs, Fort Hall Agency, Idaho
- U.S. Forest Service, Logan, Utah
- U.S. Forest Service, Patis & Preston, Idaho
- Soil Conservation Service, Kemmerer, Wyoming
- Environmental Protection Agency, Denver, Colorado*

State Agencies

- Director of Aeronautics - Idaho
- Idaho Department of Public Lands
- Idaho State University
- Idaho Public Utilities Commission
- Public Service Commission - Wyoming
- Department of Economic Planning & Development - Wyoming*
- Air Resources Council - Wyoming
- Department of Anthropology, University of Wyoming*
- Highway Department - Wyoming
- Wyoming Game & Fish Commission
- Department of Health and Social Services - Wyoming*
- State Archives & Historical Department - Wyoming
- University of Wyoming

Local and Private Entities

Idaho Power Company, Bosie, Idaho

Idaho Land & Appraisal, Bosie, Idaho

State Multiple Use Advisory Board - Idaho

Pacific Power & Light Company, Portland, Oregon*

Utah Power and Light Company, Salt Lake City, Utah

Union Pacific Railroad, Omaha, Nebraska

Uinta Development Company, Cokeville, Wyoming

Sweetwater County Planning & Zoning Board - Wyoming*

Lincoln County Commissioners - Wyoming

State Multiple Use Advisory Board - Wyoming

City of Rock Springs, Wyoming

Town of Green River, Wyoming

Town of Kemmerer, Wyoming

Town of Cokeville, Wyoming

Local School District - Rock Springs, Wyoming

B. DISTRIBUTION OF DRAFT STATEMENT

The "Second Draft Environmental Impact Statement for the Jim Bridger Thermal-Electric Generation Project". was printed and distributed from the Wyoming State Office, Bureau of Land Management, Cheyenne, Wyoming.

A total of 200 copies were distributed to Bureau Offices for further distribution through Department and Agency channels and for sale to other entities. Additional distribution and sale included other Federal Agencies 10, State Agencies 16, local government 6, Universities 8, and private entities 31 copies.

Primary consultation and coordination in preparation of the Final Statement included the following;

Federal Agencies:

Environmental Protection Agency, Denver,Colorado
Bureau of Sport Fisheries and Wildlife, Albuquerque, New Mexico
Bureau of Sport Fisheries and Wildlife, Green River, Wyoming
Bureau of Reclamation, Salt Lake City, Utah
U.S. Geological Survey, Denver, Colorado
U.S. Geological Survey, Cheyenne, Wyoming

State Agencies:

Colorado Game and Fish Commission, Denver Colorado
Wyoming Outdoor Coordinating Council, Lander, Wyoming

Local and Private Entities:

Colorado Plateau Advisory Council, Flagstaff, Arizona
Sierra Club, Dubois, Wyoming

Following is a listing of Federal, state, local agencies, and Individuals from which comments have been requested or received, with responders indicated by "*".

Federal

* Director, Environmental Project Review, BLM, Washington, D. C.
* Acting Ass't. Director, Legislation & Plans, BLM, Washington, D. C.
* Director, Bureau of Land Management, Washington, D. C.
BLM State Director, Alaska State Office
" " " Arizona State Office
" " " California State Office
" " " Colorado State Office
" " " Idaho State Office
" " " Montana State Office
" " " Nevada State Office
" " " New Mexico State Office
" " " Oregon State Office
" " " Utah State Office
Director, BLM, Denver Service Center, Denver, CO
Director, BLM, Portland Service Center, Portland, OR
Salem BLM District Office, Salem, OR
Montrose BLM District Office, Montrose, CO
Prineville BLM District Office, Prineville, OR
Worland BLM District Office, Worland, WY
Lander BLM District Office, Lander, WY
Rawlins BLM District Office, Rawlins, WY
Rock Springs BLM District Office, Rock Springs, WY
Pinedale BLM District Office, Pinedale, WY
Casper BLM District Office, Casper, WY
Black Hills National Forest, Custer, SD
* Environmental Protection Agency, Denver, CO
Environmental Protection Agency, San Francisco, CA
Director, Office of Federal Activities, EPA, Washington, D. C.
* Administrator, Environmental Protection Agency, Washington, D. C.
U. S. Geological Survey, Cheyenne, WY
* U. S. Geological Survey, Washington, D. C.
Bureau of Reclamation, Cheyenne, WY
* Bureau of Reclamation, Denver, CO
Bureau of Reclamation, Salt Lake City, UT
* Bureau of Reclamation, Washington, D. C.
* U. S. Forest Service, Region 4, Ogden, UT
* Federal Power Commission, Washington, D. C.
* Bureau of Indian Affairs, Washington, D. C.
* Soil Conservation Service, Washington, D. C.
* Department of Agriculture, Washington, D. C.
* Federal Highway Administration, Cheyenne, WY
* Department of Housing & Urban Development, Denver, CO
* Department of Housing & Urban Development, Seattle, WA
Bureau of Sport Fisheries & Wildlife, Green River, WY
* Bureau of Sport Fisheries & Wildlife, Washington, D. C.
Bureau of Sport Fisheries & Wildlife, Salt Lake City, UT
* Bureau of Sport Fisheries & Wildlife, Boise, ID
* Bureau of Outdoor Recreation, Seattle, WA
* Bureau of Outdoor Recreation, Denver, CO
* Missouri River Basin Planning Office, Omaha, NB

* U.S. Atomic Energy Commission, Washington, D.C.
* U.S. Coast Guard, Washington, D.C.
* Department of Agriculture, Washington, D.C.
* Bureau of Mines, Washington, D.C.
* Ass't Secretary of Commerce, Washington, D.C. (comments prepared by Nat'l Oceanic & Atmospheric Administration)
* Deputy Ass't Secretary for Environment & Urban Systems, Washington, D.C.
* Director, Office of Oil & Gas, Department of Interior, Washington, D.C.

State

Wyoming

* Governor, State of Wyoming, Cheyenne, WY
Federal Program Coordinator, Cheyenne, WY
* Director, Wyoming Recreation Commission, Cheyenne, WY
* Director, Air Quality Sec., Dept. of Health & Social Serivces, Cheyenne, WY
Department of Economic Program & Development Dept., Cheyenne, WY
Public Service Commission, Cheyenne, WY
* Wyoming Game & Fish Commission, Cheyenne, WY
Wyoming State Library, Cheyenne, WY

University of Wyoming

Geological Survey of Wyoming, Laramie WY
Division of Plant Science, Laramie, WY
* Head, Range Management Section, Laramie, WY
Professor, Department of Zoology, Laramie, WY
Civil & Architectural Engineering Department, Laramie, WY

Other

* Colorado Division of Planning, Denver, CO
University of Minnesota School of Business Administration, Minneapolis, MN
Executive Director, Environmental Quality Council, Helena, MT
State Planning Coordinator, State of Utah, Salt Lake City, UT
* Associate Professor & Curator of Archeology, Idaho State University, Pocatello, ID
* Idaho Fish and Game Department, Boise, ID
* Commissioner of Public Lands, Boise, ID
Idaho Planning and Community Affairs Agency, Boise, ID
Idaho State University, Pocatello, ID

Local - Wyoming

Mayor of Green River, Green River, WY
Mayor of Rock Springs, Rock Springs, WY
Mayor of Cokeville, Cokeville, WY
Mayor of Kemmerer, Kemmerer, WY
Lincoln County Commissioners, Kemmerer, WY
Sweetwater County Planning & Zoning Commission, Rock Springs, WY

Local - Idaho
Town of Montpelier
Town of Soda Springs
Town of American Falls
Bannock County Commissioners
Bear Lake County Commissioners
Caribou County Commissioners
Power County Commissioners

Organization and Individuals
Environmental Officer, Bonneville Power Administration, Portland, OR
Idaho Power Company, Bosie, ID
* Project Coordinator, Jim Bridger Plant, Pacific Power & Light Co., Portland, OR

Pacific Power & Light Company, Casper, WY
Wyoming Division, Izaak Walton League, Casper, WY
Wyoming Wildlife Federation, Casper, WY
Chairman, Wyoming Multiple Use Advisory Board, Rock Springs, WY
* Wyoming Outdoor Coordinating Council, Lander WY
Associated Press, Cheyenne, WY
The Colorado Magazine, Denver, CO
* Wyoming Representative, Sierra Club, Dubois, WY
Colorado Plateau Environmental Advisory Council, Flagstaff, AZ
Michael Williams, Los Alamos, NM
Jim Binando, Middleton, WI
John Winkel, Laramie, WY
Executive Director, Colorado Open Space Foundation & Rocky Mountain Center on Environment, Denver, CO
* President, Idaho Environmental Council, Idaho Falls, ID
* Murie Audubon Society, Casper, WY
Deputy ASS't Secreatry for Environmental & Urban Systems
* League of Women Voters, Boise, ID
* Superintendent of Recreation & Parks, Burley, ID
* Chairman, Idaho Association of Soil & Water Conservation, Wilder, ID
* Perry Swisher, Pocatello, ID
Robert Twiss, Berkeley, CA
Idaho Wildlife Federation, Moscow,ID
Idaho State Journal, Pocatello, ID

C. SUMMARY OF COMMENTS

Respondent	Comment	Location of Discussion in Statement - remarks
Robert L. Lang (11-8-71 Professor and Head Range Management Section University of Wyoming Box 3354, University Station Laramie, WY 82070	Pointed out fly ash can support vegetation with no addition of soil and little or no fertilizer. Fly ash also appears valuable for neutralizing acid spots in spoil banks prior to revegetation. Suggests that returning spoil banks to original contours not necessarily best; cited example of permanent ponds and lakes established at Kemmerer Coal.	Section VA2. Various land forms will be considered in reclamation plans either under State law or Federal regulations.
Paul H. Westedt, Director (11-4-71) Wyoming Recreation Commission Box 309 Cheyenne, WY 82001	Suggested use of right of way corridors for recreation purposes where recreation activities do not require natural settings.	Section VB3
D. P Shoup (11-8-71) USDI Field Representative (Comments prepared by Missouri River Basin Planning Officer Paul L. Harley Dept. of Interior Missouri River Basin Plng. Office P. O. Box 428 Omaha, Nebr. 68101)	Wants more attention given to specific plans for disposing of waste water/blowdown residues and surveillance for ground water contaminants and corrective action. Question: Did the level of particulates show values are below the standards or above them?	Sections VID, VA1

Respondent	Comment	Location of Discussion in Statement - Remarks
B. Robert Butler (9-8-71) Associate Professor and Curator of Archeology Idaho State University Pocatello, Idaho	Comments on pre-publication draft sent to Dr. Earl H. Swanson, Director, Idaho State University Museum. No archeological impact from transmission lines in Idaho.	Section VB5
G. C. Trombley (9-23-71) Commissioner Idaho Dept. of Public Lands Boise, Idaho 83707	No suggestions for input	
Vern Hamre (9-22-71) Regional Forester USFS 324--25th Street Ogden, Utah 84401	Comments on pre-publication draft	Comments incorporated in published draft statement
L. Manning Mutzing (11-16-71) Director of Regulation Atomic Energy Commission Washington, D.C. 20545	No comment on radiological matters	

Respondent	Comment	Location of Discussion in Statement - Remarks
Robert W. Scott (11-12-71) Field Supervisor Div. of River Basin Studies Bureau of Sport Fisheries & Wildlife Room 2225, Federal Building 125 South State Street Salt Lake City, Utah 84111	Requested that specifics of pipeline right of way be reviewed under terms of Fish and Wildlife Coordination Act.	This will be done. Ch. VC5
John J. Wilder (11-22-71) Ass't. Reg. Administrator for Dept. of Housing and Urban Development Federal Building 19th & Stout Streets Denver, Colorado 80202	No comments on adverse impact on urban environment.	
John M. Demmer, Div. Engineer (11-24-71) U.S. Dept. of Transportation Federal Highway Administration Box 1127 Cheyenne, WY 82001	No comment.	
John R. Merrill (11-29-71) Ass't. Reg Administrator for Community Planning & Management Dept. of Housing and Urban Development Arcade Plaza Bldg. 1321 Second Ave. Seattle, Wash. 98101	Adequate coverage of environmental impacts in our areas of concern. Would like to see better definition of work force, temporary and permanent; and plans being made to provide housing, schooling, transportation and necessary public services. Are land use plans being prepared by communities? What are plans if archeological survey reveals values?	Sections lVG.; VA2d.; VA2g.; and VB5.

Respondent	Comment	Location of Discussion in Statement - Remarks
Robert E. Sundin (11-30-71) Director, Air Quality Section Wyo. Dept. of Health and Social Service State Office Building Cheyenne, WY 82001	No responsibility for construction standards--Only monitor air quality after construction.	
Keith V. Becker (12-1-71) Executive Director Wyoming Outdoor Coordinating Council Box K Lander, WY 82520	Unfortunate project is under construction. Significance would justify a greater degree of public involvement prior to authorization. Red Desert type planning effort plus citizen groups as well as county and municipal government might well have participated. Voices concern on air quality.	Red Desert planning effort will consider impacts of J. B. project. Sections 1VI; Va1.

Respondent	Comment	Location of Discussion in Statement - Remarks
Laney Hicks (12-1-71) Sierra Club North Great Plains Office P. O. Box 721 Dubois, WY 82513	Alternatives to the proposal.	Section II.
	Power shortage questioned. Wants to know economic benefits to State on water, taxes and royalties. What are costs of increased service, damage from air pollution, loss in land productivity, wildlife impact and visibility degradation.	Section VH. covers Economic impacts, Environmental costs are identified throughout in Section V.
	Unique Communities - Rare Species. All areas are unique because they are different. Full summary of interrelationships, biologic and geologic (including selenium bearing formations) would identify stability or lack of it.	Section IV H1; also IVE.1
	Economic and Cultural Patterns, Future Trends. Bridger plant only one of many. Increase in mining will change existing land use and cultural patterns. More than one source of population and income growth needed.	Sections IVJ.; VD6
	Soil Erosion and Deposition. Is all top soil to be stored separately and what is time period allowed under Federal and State rehabilitation requirements? Three to 8 years too much.	Section VID
	Scenic Views. Strip mining remote areas same as populated areas.	Impacts were recognized in Section VD5.
	Coal Resources. Requests more information on coal resources in the area.	Section IIIA4
	Revegetation. Revegetation impossible. Strip mining destroys coherence and stability of land. Wants underground mining.	Section VIC. Overburden and nature of coal deposit make underground operation unfeasible and hazardous at this time.
	Short Term Uses vs. Long Term Productivity. Long term impacts of air pollution could well go beyond life of project.	Section VIII
	Guarantees on pollution control equipment. Will efficiency be guaranteed and enforced?	VAIe.

Respondent	Comment	Location of Discussion in Statement - Remarks
Michael D. Williams John Muir Institute (no address)	Trace Elements. Requests additional discussion.	Section VA1d.
	Disposal of Fly Ash. What are plans with regard to air quality?	Section VI D.
	Conversion of Sulfur Oxides to particulates. Suggests there will be an impact on visibility.	Section VA1c.
	Coal and Fly Ash Composition - Fly Ash size distribution. Requests description.	Section VA2b.
	Sulfate Deposition. Suggest there will be a long term change in soil Ph.	Section VA1c.
	SO2 and NOx emissions and relation to air quality standards. Questions presentation of data.	Section VA1b.
	Stack height. Questions validity of high stack approach.	Section VA1b.
	NOx levels. Questions validity of company data.	Section VA1b.
	Fumigation of Inversion breakup Conditions. Questions validity of conclusions.	Section VA1b.
	Damages to Power lines from Trona Plant Emissions. Questions validity of damage.	Section VA1b.
	Defacto Wilderness. Requests study for potential wilderness.	No wilderness qualities which would qualify areas crossed by transmission lines as designated wilderness areas have been identified.

Respondent	Comment	Location of Discussion in Statement - Remarks
Gerald A. Jayne, Pres. (10-3-71 & 11-21-71) Idaho Env. Council 1568 Lola Street Idaho Falls, Idaho 83401	Asserts Wyo. & Mont. is the least spoiled areas in the contiguous 48 states. Environmental impacts appearing to be most severe are air pollution, soil disruption, and transmission line effects.	Mr. Jayne's summary of severe impacts correlates with findings from the matrix system utilized by the task force team.
	Air Pollution. What quarantee does public have that companies will install equipment which will actually be this efficient? Raises questions and furnishes data on public health implications of SO2.	Section VA1e.
	Soil Disruption. Questions authority to control reclamation. Will exotic species be needed? What are adverse impacts? Questions coal quantity.	Sections VIC.; VB1; VE2; VD1.; and IIIA4.
	Voices concern for effect of lines on wildlife.	Section VB2
	Requests public meetings in Idaho & Wyo.	No public hearing conducted. Intense public concern was recognized. Information need was felt to be in the nature of highly technical data and analyses.
	102 statements should be filed on coal leasing. Wants all leases included in final impact statement.	Federal Coal leases were issued prior to N.E.P.A. of 1969. Refer to Section VIC.

Respondent	Comment	Location of Discussion in Statement - Remarks
Bayard D. Rea (12-2-71) Murie Audubon Society (Comments to Sen. Gale McGerr)	Analyzes transmission towers for damage to eagles. Concludes that 7' 10" spacing between hot wires and any other metal will be safe for eagles. Wants a drawing of the tower, insulators, and conductor wires with dimensions shown. Aesthetic advantage of tower design is preferable even tho guy wires may endanger flying birds.	Section VF
Richard L. Brown (12-7-71) Principal Planner Colo. Div. of Planning 1575 Sherman St. Denver, CO 80203	No comment.	
John E. Hirten (12-2-71) Deputy Ass't. Secretary for Environment & Urban Systems	Suggests means to reduce vison impact of transmission lines on population concentrations and adjacent to major highway right-of-way. Possibilities are (1) screening, (2) relocating, or (3) possibly underground.	Section VIA. Undergrounding, while extremely desirable would be technologically unfeasible at 345 KV for the distance required.
Burtt Trueblood, Chairman (12-1-71) Idaho Ass'n. of Soil & Water Cons. Route 1 Wilder, Idaho 83676	Feels that federal air quality standards not strict enough.	The analysis conducted did not identify impacts or effects from which the adequacy of air quality standards could be judged. Hopefully research will yield solid data in the near future to accomplish this task.
	Concerned about availability of light for alfalfa seed growing.	Sections VAlc and VIII.

Respondent	Comment	Location of Discussion in Statement - Remarks
Perry Swisher (12-13-71) 355 S. 11th Av. Pocatello, ID 83201	Requests a geological history of the area of the plant site plus general description of soil, terrain and medians and extremes in rainfall, runoff and wind velocities.	Sections IVA.-B.-C.-D.
Jack L. Keen, Supt. (12-13-71) Recreation & Parks, Burley Director, IRPS Society Burley, Idaho 83318	No comment of project.	
Vern Hamre, Reg. Forester (12-13-71) U. S. Forest Service 324--25th St. Ogden, UT 84401	Transmission lines now only cross Cache Nat'l. Forest. Suggests alternative language giving route across Forest lands. Wants photo No. 9 deleted.	All comments incorporated
League of Women Voters of Idaho (12-13-71) 329 S. Phillippi Boise, ID 83705	Should have been informational meetings. Concerned about plant operations and wants adherence to prevention of air pollution.	Sections VAle.: VID.
Jos. C. Greenley, Dir. (12-13-71) Idaho Fish and Game Dept. P. O. Box 25 Boise, ID 83707	Revegetation of disturbed areas should include plant species of maximum value to wildlife. Wants power lines marked at critical points in aerial big game census areas.	Sections VIE; VF.

Respondent	Comments	Location of Discussion in Statement - Remarks
Liven A. Peterson, Jr. (12-13-71) Field Supervisor, BSF&W Boise	Of the two alternatives of powerline location along Blackfoot River. Suggests the lower route adjacent to hills. Suggests specific fish and wildlife protective measures after consultation with both Idaho & Wyo. game & fish and BSF&W included in right-of-way permits. Wonders if it is advisable for BLM to require a bond until all stipulations have been complied with.	Section XC2, and VIE. Bonding requirements will be included.
Norman A. Berg, Acting (12-13-71) Administrator Soil Conservation Service Washington, D.C. 20250	Comments will be included in Dept. of Agriculture's.	

Respondent	Comment	Location of Discussion in Statement - Remarks
Dept. of the Interior Bureau of Outdoor Recreation (12-14-71)	(1) Idaho Dept. of Parks should be included in review, (2) should use latest research in minimizing scenic disruption, (3) adverse impacts of snowmobiles on big game could be controlled with proper management, (4) questions the use of NYC powerline example on visibility, (5) wants to know environmental impact of furnishing more power to northwest. Is this sound regional development?	(1) Idaho Dept. of Parks and Idaho Planning and Community Affairs agency (which is the state clearing house) were consulted as to impact on existing or proposed parks, including, grant-in-aid projects. No specific adverse impacts were identified. (2) USDI, USDA, and other Research Techniques on minimizing impact were utilized. (Sections VB4. & VIA.) (3) Section VB2. (4) While the NYC example is far removed from Wyo., it served to illustrate the relationship between humidity, sulfur dioxide and visual range. (5) Jim Bridger power would be one factor in growth of Pacific Northwest in the coming years. Certain adverse impacts will undoubtedly accompany the growth. Conversley, adverse impacts would occur through a failure to meet valid need for power. This pertinant but difficult question must be answered through comprehensive efforts such as national land use planning legislation now being considered by Congress.

Respondent	Comment	Location of Discussion in Statement - Remarks
Bureau of Outdoor Recreation (continued)	(6) Wants a resource inventory and analysis completed before impacts are known. Suggests power companies fund 3 to 6 million dollar inventory.	(6) Present resource information, while not as comprehensive as desirable, enables the definition of numerous impacts identified throughout the report. Areas of information gaps or unknowns have been identified and efforts will be made to correct this.
	(7) Questions implications of water use.	(7) Section VC1.
	(8) Requests detail on economic impacts.	(8) Section V4.
	(9) Pipeline and Power line right-of-way locations - alternatives.	(9) Section VB.-C.; and VIA.-C.
	(10) Questions splitting of power line west of Montpelier. Suggests relocation of older power lines in "new" corridors.	(10) Section XC2.
	(11) Wants statement to delineate requirements and stipulations for pollution and reclamation.	(11) Section VIC.-D.-E.
	(12) Will BLM require standards to be met on private lands as a condition of issuing right-of-way permits?	(12) Standards as outlined in VIE will apply to Public Domain lands administered by BLM.

Respondent	Comment	Location of Discussion in Statement - Remarks
Ellis L. Armstrong, Commissioner (12-20-71) Bureau of Reclamation Washington, D.C. 20240	(1) Should contain more information on present and projected level of economic development, employment, and related social or cultural factors on the basis of no project.	(1) Section VH.; IVH-J.
	(2) Monitoring and oversight responsibilities for air and water quality with plant operations should be discussed.	(2) Sections VI.C-D.-E.
	(3) Should have a map showing existing and planned power facilities.	(3) Map included in Section X
	(4) Location map should relate Denver, Cheyenne, and Casper and all existing and planned thermal electric plants.	(4) Map included in Section III.
	(5) Questions three 345 KV lines instead of two 500 KV.	(5) Section XC1.
	(6) Compare adjacent state air quality standards.	(6) Section VA1b.
	(7) What is probability of water leaking occurrence. Need more information on geology.	(7) Sections IV. B.-C.; VD2.
	(8) Cumulative Impact problem should be given more adequate treatment regarding flue emissions.	(8) Section VE.

Respondent	Comment	Location of Discussion in Statement - Remarks
W. M. Benkert, Rear Admiral (12-13-71) U.S. Coast Guard Chief, Office of Marine Env. & Systems 400 Seventh Street, SW Washington, D.C. 20590	(1) From Federal Railroad Administration review: Worried about inductive coupling or direct fault between transmission lines and communication and signal lines of UPRR.	(1) Section VB6
	(2) Coast Guard wants map in final statement showing railroad lines, highways, roads, and transmission lines. Points out future transportation planning needs if JB has to import coal in the future. Recommends implementation of project as early as possible.	(2) Information included in Exhibit No. 1.
T. C. Byerly, Coordinator (12-16-71) Environmental Quality Activities Department of Agriculture Washington, D.C. 20250	Raises questions on revegetation and wind erosion.	Section VIC
Bureau of Mines (12-16-71) Washington, D.C. 20240	(1) Should include discussion of oil and gasfields in the area. Cites Wyoming's petroleum reserves and current production and final statement should include a brief comment explaining why petroleum is not an acceptable alternative.	(1) Section XA5.
	(2) Power line location should include impacts on future mineral development.	(2) Section VB3.
	(3) Should include environmental consequences resulting from processing and stockpiling coal, i.e., contamination of surface and ground water and the addition of dust to the air (during operations).	(3) Sections VD and V1D.

Respondent	Comment	Location of Discussion in Statement - Remarks
Director (12-23-71) Bureau of Sport Fisheries & Wildlife Washington, D.C. 20240	(1) Various comments on deficiencies in wildlife information. (2) More emphasis should be placed on use of surge pond. If pond is on public land, provision for fishery use should be recommended in the right-of-way under authority of the Fish & Wildlife Coordination Act.	(1) Sections IVE.; VA2f.; VB2.; VC3.; and VD4. (2) Section VIB.

Respondent	Comment	Location of Discussion in Statement - Remarks
Archie M. Kahan, Ch. (12-29-71) Div. of Atmospheric Water Res. Management Bureau of Reclamation Bldg. 67, Denver Federal Center Denver, CO 80225	No serious discrepancies are apparent between the two emission model methods. NOX standards can be exceeded under TVA analysis, however, analysis assumed worst possible combination of ingredients in the coal. Providing NOX control facilities would probably reduce emissions to an acceptable level even when such a combination of ingredients exists.	Section VA1.
Director (12-29-71) U. S. Geological Survey Washington, D.C. 20242	Need more data on ground water movement in relation to disposition of blowdown residue and bottom ash. Need a monitoring of wells around disposal pits, wells,and stream gauging and sampling sites to assist hydrologic effects of mining operations. Need a better explanation of reclamation plants.	Sections IVB.-C.-D.; VD2.; V1C.-D.
Commission of Indian Affairs (1-7-72) Bureau of Indian Affairs Washington, D.C. 20242	Notes general lack of data for Emission Analysis.	Additional data collected, analyzed and included in section VA1.
T. A. Phillips, Ch. (1-20-72) Bureau of Power Federal Power Commission Washington, D.C. 20426	Gives explanation for need of project.	Section II

Respondent	Comment	Location of Discussion in Statement - Remarks
Assistant Secretary of Commerce (12-16-71) (Deputy Ass't. Sec. for Env. Affairs Sidney R. Galler) Washington, D.C. 20230 (Comments prepared by Air Resources Env. Laboratory, Nat'l. Oceanic & Atmospheric Adm.)	Transmitted the comments of Nat'l Oceanic & Atmospheric Administration. Major fault is lack of a detailed terrain map showing elevation contours within a radius of at least 50 km from the site. Cites Aspen Mountains as an example. They strongly recommend that onsite meteorological data be analyzed and presented in final statement. Reserve further comments until such information is made available.	Map included in Section VA. Also see Section VID for monitoring.
Wyoming Game and Fish Commission (1-28-72)	(1) 1200 antelope counted in powerplant and mining area. This winter estimated 2,000 head will winter here. A mild winter will see 600-800 head. Year-round use by deer and other wildlife species should be noted. Area also has potential for chuckar partridge.	(1) Section VA2f.
	(2) Questions if surge pond can support fish due to chemical treatment probably needed to decrease algae. Reclamation plans questioned. Pipeline intake structure should be better explained.	(2) Sections VC3 and V1B.
	(3) Red Desert wildlife conflicts should be considered.	(3) Section IVI.

Respondent	Comment	Location of Discussion in Statement - Remarks
Keith V. Becker (2-4-72) Wyoming Outdoor Coordinating Council Lander, Wyoming	Expressed concern about fluorine and other trace elements in Jim Bridger coal sources. Feels concern justifies public hearings.	Section VAld. No hearing conducted. Intense public concern was recognized. Information need was felt to be in the nature of highly technical data and analyses.
Environmental Protection Agency (2-4-72) Washington, D.C.	Comments, identified the following areas of information shortage or special concern.	Response is in the following sections:
	(1) SO2 removal (2) Design of the stacks and air pollution abatement equipment.	(1) (2) VA1.
	(3) Mineral or chemical content of the ash	(3) VA2B.
	(4) Emission rates of heavy metals and radionuclides.	(4) VAld.
	(5) Synergistic effects of pollutants, particularly stack effluents and cooling tower plume interaction.	(5) VE
	(6) Effect of emissions on adjacent air quality regions.	(6) VAlc.
	(7) Disposal of solid wastes and cooling water blowdown.	(7) V1D
	(8) Impact of strip mines	(8) VD
	(9) Ozone production	(9) VB7
	(10) Power line location alternatives	(10) XC2
	(11) Monitoring systems	(11) XC2

D. COMMENTS RECEIVED FROM RESPONDENTS

The comments, as received from the respondents, follow this title page and are arranged in near chronological order.

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

11/15 Initial

LEAD RESP.

1791, 2850 (911)

TO : State Director, Wyoming

DATE: November 11, 1971

FROM : Associate State Director, Idaho

SUBJECT: Comments on First Draft of Jim Bridger Environmental Impact Statement

Attached for your review are comments we have received from U.S.F.S., Region 4, Idaho State Department of Public Lands, Idaho State University, and the Idaho Environmental Council.

Clair M. Whitlock

cc: Director (220)
w/attachments

5010-108

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

U.S. Department of the Interior
SEP 23 1971
Bureau of Land Management
Idaho State Office
Boise Idaho

324 25th Street
Ogden, Utah 84401

2720

SEP 22 1971

William L. Mathews, Director
Bureau of Land Management
Federal Building, Room 334
550 West Fort Street
Boise, Idaho 83702

Dear Mr. Mathews:

Enclosed is a copy of Cache National Forest Supervisor Merlin I. Bishop's Environmental Analysis Report, pertaining to the proposed Jim Bridger Project power transmission lines that would affect National Forest lands.

As noted in his Environmental Analysis Report, Supervisor Bishop is in the process of considering alternative routes to accommodate the proposed power transmission lines. He will expect to further study the situation and review the possibilities with Idaho Power Company representatives and personnel of the Bureau of Land Management prior to selecting the most desirable route. It is our feeling that preparation of a final environmental statement should not proceed until the exact location for the transmission line is agreed upon. If you agree, we would like to provide direct input for the final statement. If you prefer to go ahead, we will prepare a separate environmental statement for the National Forest lands involved after the route location is determined. We would like to discuss this point further with you.

Your statement on page 42 of your Draft Environmental Impact Statement to the effect that the exact locations of transmission lines from Montpelier to Borah and Kinport Substations have not been determined is in keeping with Supervisor Bishop's Environmental Analysis Report. We suggest that "exact route locations are being evaluated." As written, it could be interpreted to the effect that the Forest Service has suggested and the Company has agreed to a right-of-way corridor. This is not correct. We suggest, also, that reference to additional transmittion lines, in addition to the two parallel lines now proposed, be deleted. We would not

want to prematurely infer that additional lines would be environmentally acceptable, as concerns National Forest lands. When, and if proposed, the environmental impacts of such would have to receive specific, additional evaluation.

Thank you for the opportunity to comment on your draft environmental statement.

Sincerely,

Vern Hamre

VERN HAMRE
Regional Forester

Enclosure

xc:
✓ BLM

CACHE NATIONAL FOREST

LOGAN, UTAH

ENVIRONMENTAL ANALYSIS REPORT
FOR THE
JIM BRIDGER THERMAL-ELECTRIC
GENERATION PROJECT
IDAHO POWER COMPANY

Submitted: September 10, 1971

By:

Title: Forest Supervisor

CONTENTS

		Page
I.	Description	1
	A. Purpose of Proposed Use	1
	B. Description	1
	C. Size	1
	D. Land Status	2
	E. Graphic Sections	2
II.	Environmental Impacts	2
	A. General	2
	B. Timber	3
	C. RANGE	3
	D. Watershed	3
	E. Fire Control	4
	F. Transportation	4
	G. Wildlife	5
	1. Inventory of Wildlife	5
	H. Soils	6
	I. Air	6
III.	Favorable Environmental Effects	6
	A. Social and Economic	6
IV.	Adverse Environmental Effects Which Cannot be Avoided	7
V.	Alternatives to the Proposed Actions	7
	A. No Action	7

B. Approve an Alternate Route 7
  1. Soda Gap 7
  2. Nounan Valley - Nelson Canyon 7
  3. The "Gully" Route 8
VI. Consultation With Others 8

I. Description

A. Purpose of Proposed Use or Activity

The Idaho Power Company officials have informally requested permission to construct two 345 K.V. transmission lines across the north end of the Cache National Forest. The purpose of this proposed activity is to transmit power produced at the Jim Bridger Thermal-Electric Generation plant into the Idaho Falls and Pocatello areas.

B. Description

The proposed right-of-way would cross the Forest boundary on the east side approximately one-half mile north of the creek in North Canyon. From there it would follow westerly along the north side of North Canyon to a point several hundred feet north of the mouth of the Middle Fork where it would cross the Main Canyon and the North Canyon-Lago road. From there it would continue in the same general direction to the hydrographic divide between North Canyon and Rocky Knoll Canyon. At this point, a short distance west of Humberg Springs, it would follow in a northwesterly direction past Tie Camp Springs and down the open ridge south of South Ant Canyon to the Forest boundary. The area is located in Sections 34, 35, and 36, T. 11 S., R. 41 E.; Section 1, T. 12 S., R. 41 E., and Sections 3, 4, 5, 6, 11, and 12, T. 12 S., R. 42 E., Boise Meridian in Franklin, Caribou, and Bear Lake counties, Idaho.

C. Size

The proposed two transmission lines would be approximately 9.4 miles long, 315 feet wide, and occupy 359 acres of Cache National Forest

land. Although the time schedule for the construction of the project is indifinite at this time, it appears the right-of-way across Cache National Forest might be cleared as early as 1972.

D. Land Status

Only National Forest lands would be involved in the use covered in this document. These lands were transfered from Public Domain to National Forest status in 1906, and there are no known encumberances upon the land.

E. Graphic Sections

A map obtained from the Idaho Power Company is on file in the Forest Supervisor's Office.

II. Environmental Impacts

A. The right-of-way clearing, access road construction, and line structures would detract from the esthetics of the general area. From State Highway No. 36, the road to North Canyon, and at several points along the road in North Canyon, the project will be visible. Little can be done to lessen this impact. This area is mountainous-type land, on which normal Forest activities have occurred over the years. These activities have not altered the esthetics of the Forest environment. Though not outstanding, the area is esthetically pleasing. Many Forest visitors traverse the area because of their desire to get away from the rural valley areas and impacts made by man. Maintenance of this Forest ecology is essential. Increasingly large numbers of people are viewing the area from the ground and air.

Wherever visible from the existing and/or planned system roads, long sections of clearing, high stumps, and debris would detract from the

scenic values. Towers, lines, construction camps, material stockpiles, and access roads will depreciate esthetic values.

B. Timber

Well over a million feet of commercial timber would be cut in the clearing operation. Most of it would be lodgepole pine and Douglas-fir. It varies in size from post and pole material to large sawlogs. Smaller quantities of alpine fir, limber pine, and Engelmann spruce would be cut. Clearing would result in the creation of slash along the right-of-way. A spruce bark beetle buildup could result from the improper disposal of slash.

C. Range

The entire length of the proposed line is within range allotments. Range improvements may have to be moved or added. Access roads may adversely effect livestock distribution, creating a management problem. Forage will be destroyed along roads and at structure sites.

Canada thistle is present in several areas on or near the proposed right-of-way. This plant is very aggressive and would invade and occupy nearby areas where the soil is distrubed by logging and construction operation unless controlled.

D. Watershed

Water, from the watershed land crossed by this line, is our most valuable product. Steep slopes would be crossed and some unstable water-yeilding slopes would be encountered. Construction and logging

operations on these areas could result in serious erosion problems. Slump areas could be created. If proper logging methods are not used or if access roads are not properly designed, constructed, and restored, accelerated erosion would occur. Snow avalanche areas could be created by clearing the very steep timbered slopes in the Mill Hollow and Meadow Creek drainages. A hydrologist should provide information on the hydrology of the land that would help minimize the impact on the watershed.

In 1961 erosion control structures were constructed in old logging roads and skid trails to stop erosion in North Canyon. It may be desirable to use sections of these roads and trails for access. Unless the structures are restored, the initial investment would be lost and erosion would become a problem.

E. Fire Control

Clearing the right-of-way would create slash and increase the fire hazard. Heavy equipment and chain saws working along the right-of-way could start fires if proper spark arresters are not used.

F. Transportation

The Forest road system and old logging roads are considered adequate for access to the right-of-way on the east slope. Additional roads would be an adverse impact on most resources. On the west slope, there would be a need for approximately an additional six miles of access road. The present South Ant road is steep, inadequate, and has poor drainage.

If access is provided along the proposed powerline route, it will be impractical to close this addtional access to the public due to the open terrain. It is therefore necessary that permanent access be constructed to assure continued stable watershed conditions.

G. Wildlife

1. Inventory of Wildlife

a. Game species present in the area include mule deer, elk, moose, mountain lion, blue grouse, ruffed grouse, and mourning dove. The most common and principal species from a habitat management standpoint are mule deer, elk, blue grouse, and ruffed grouse.

b. The non-game species inhabiting the area are:

1. Mammals - snowshoe hare, mountain cottontail, red squirrel, Uinta ground squirrel, golden-mantled squirrel, least chipmunk, Say chipmunk, northern pocket gopher, porcupine, coyote, long-tailed weasel, badger, and bobcat. Of these species, the squirrels, chipmunks, and porcupine are the species commonly seen by man.

2. Birds - goshawk, red-tailed hawk, sparrow hawk, golden eagle, great horned owl, crow, hummingbird, red-shafted flicker, yellow-bellied sapsucker, Hairy woodpecker, northern three-toed woodpecker, steller's jay, Clark's nutcracker, mountain chickadee, robin, magpie, mountain bluebird, pine siskin, western tanager. During the summer the commonly seen birds are red-tailed hawk, red-shafted flicker, steller's jay, Clark's nutcracker, and mountain chickadee.

The additional "edge effect" created by the cutting of the more dense conifer stands could enhance the habitat for the principal wildlife species.

The cutting of timber from Mecham Canyon east to the Forest boundary could have an adverse impact on the wildlife in this area because of the open forest that occurs and the importance of the trees for food and cover in these habitat types.

Additional roads resulting in increased human activity could cause a displacement of the principal wildlife species. The degree of impact will depend upon the intensity of human activity. Moderate, dispersed human activity should not cause any significant displacement of the wildlife.

H. Soils

The clearing of the right-of-way and use of heavy equipment would have an adverse impact on the soils. The soils would be compacted and subsoils brought to the surface. The microclimate would be changed. East of Mecham Hollow, mass stability and erosion hazards are greater than on any of the other proposed routes.

I. Air

The air in the project area is virtually unpolluted. Excessive burning of slash during period of low clearing index would add an appreciable, but temporary, amount of air pollution in adjacent valleys.

III. Favorable Environmental Effects

A. Social and Econmic

It is indicated that within the next ten years we will have need for twice as much power as is being produced today. The power is needed to improve the standard of living, provide for an increased population density, and improve the economic welfare of the area served.

IV. Adverse Environmental Effects which Cannot be Avoided

A. Visual impact of powerline structures and roads.

B. The visual impact of the cleared right-of-way traversing timbered slopes.

C. Bringing subsoil to the surface and compaction of soils reduces the productivity of the soils and the rate of water absorption.

D. Soil displacement.

E. Future timber production will be reduced.

F. Destruction of vegetation.

G. The reduction of big game habitat through the removal of browse and other vegetative cover.

H. The dust created by increased traffic over existing and proposed roads during and after construction will result in increased air pollution.

V. Alternatives to the Proposed Actions

A. No Action.

Benefits of the project outweigh adverse environmental impacts.

B. Approve an Alternate Route

1. Soda Gap

Congestion of existing powerlines, telephone lines, reservoir, powerplant, highway, railroad, and other structures precludes this route. There would be no impact on Cache National Forest lands.

2. Nounan Valley - Nelson Canyon

This route would have the least impact on any of the proposals involving Cache National Forest lands. Further investigation as to location and facilities needed is necessary before full environmental impacts can be determined.

3. The "Gully" Route

This route is approximately $1\frac{1}{4}$ miles south of and parallel to the route proposed by the applicant.

Impacts are essentially the same, but to different degrees.

For the following reasons, The "Gully" Route is recommended in preference to the applicant's proposed route:

a. Less visible from existing routes of travel.
b. Lower mass stability and erosion hazards.
c. Greater distance from Camp Bartlett. (BSA Summer Camp)
d. Favors wildlife habitat.
e. Crosses fewer streams and wet areas.
f. More productive soils which assure more prompt stabilization of soils on disturbed areas.

It is a less desirable route for the following reasons:

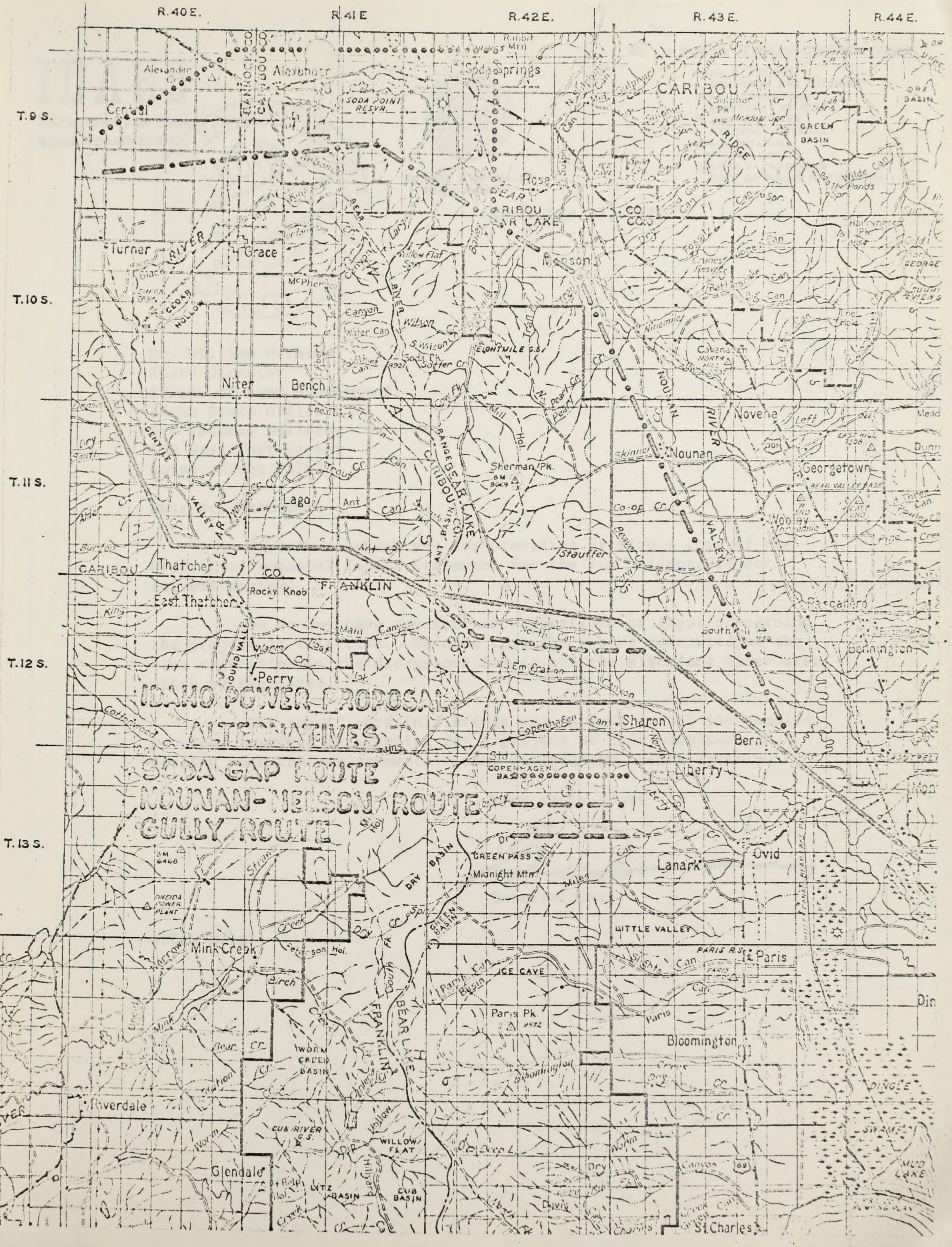
a. More timber will be removed.
b. Access will require more road construction.

VI. Consultation With Others

A. Idaho Power Company Representatives
B. Bureau of Land Management
C. Idaho Fish and Game Department
D. Franklin County Commissioner, Dean Abrams

E. Utah Power and Light Company

F. Pacific Power Company


IDAHO POWER PROPOSAL
ALTERNATIVES
SODA GAP ROUTE
NOUNAN-NELSON ROUTE
GULLY ROUTE
R.40 E.
R.41 E
R.42 E.
R.43 E.
R.44 E.
T.9 S.
T.10 S.
T.11 S.
T.12 S.
T.13 S.
Alexander
Soda Springs
CARIBOU
Central
SODA POINT RESVR.
GREEN BASIN
Rose
BEAR LAKE
CARIBOU CO.
Turner
Grace
Nelson
McPherson
Niter
Bench
Wilson
EIGHTMILE G.S.
Cavanaugh
NOUNAN RIVER
Novene
Nounan
Georgetown
Sherman Pk.
Lago
Thatcher
CARIBOU CO.
FRANKLIN
East Thatcher
Rocky Knob
Pescadero
Bennington
Perry
Sharon
Bern
COPENHAGEN BASIN
Liberty
Ovid
Lanark
GREEN PASS
Midnight Mtn.
ONEIDA POWER PLANT
LITTLE VALLEY
Mink Creek
Paris
ICE CAVE
Paris Pk.
Bloomington
Riverdale
WORM CREEK BASIN
FRANKLIN
BEAR LAKE
CUB RIVER G.S.
WILLOW FLAT
CUB BASIN
Glendale
DINGLE
SWAMP
MUD LAKE
St. Charles

IDAHO
DEPARTMENT OF PUBLIC LANDS
BOISE, IDAHO 83707

GORDON C. TROMBLEY
COMMISSIONER

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SEP 28 1971
Bureau of Land Management
Idaho State Office
Boise Idaho

September 23, 1971

Mr. William Mathews
State Director
Bureau of Land Management
Idaho State Office
334 Federal Building
550 West Fort Street
Boise, Idaho 83702

Dear Mr. Mathews:

We wish to thank you for providing us with a copy of the Draft Environmental Impact Statement for the Jim Bridger Project for our review.

We do not have any further suggestions or input concerning the project at this time. We note that the report acknowledges the line relocation in the Georgetown Summit and the Blackfoot River area which we requested.

The report certainly brings out in full detail the complex problems involved in planning for a project of this magnitude in dealing with the environmental issue demanded by todays society.

Very truly yours

G. C. Trombley
Commissioner

GCT/WJM/lgb

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U S Department of the Interior
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Bureau of Land Management
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Boise Idaho

Museum

Idaho State University
POCATELLO, IDAHO
83201

September 8, 1971

Mr. William L. Mathews
State Director
Bureau of Land Management
Idaho State Office
334 Federal Bldg.
550 W. Fort Street
Boise, Idaho 83702

Ref: 1791 (911)

Dear Mr. Mathews:

Because they were directly involved in the archaeological survey of the transmission line right-of-way for the Jim Bridger thermal-electric generation project, I asked my surveyors to read the draft of the environmental impact statement that you sent to Dr. Earl H. Swanson, Jr., Director of the I.S.U. Museum and also read it myself. What follows is our joint appraisal.

In so far as archaeological sites are concerned, the project will not result in the destruction nor the disturbance of any that we are aware of on public lands in Idaho at the present time. The proposed transmission line is so situated that it does not even directly pass over any known archaeological site on public land in Idaho, though it does come near one or two small sites. The latter will be described more fully in a report now under preparation.

Speaking only for myself, I found the draft to be rather well done on the whole. Parts VII and VIII are at the heart of the matter, and it would appear that some genuine effort has been made to reduce the aesthetic and ecologic impact of the powerline.

Sincerely yours,

B. Robert Butler

B. Robert Butler
Assoc. Prof. & Curator of
Archaeology

Idaho Environmental Council

P. O. Box 3371 - University Station
Moscow, Idaho 83843

Oct. 3, 1971

Comments on BLM 102 Statement
for Bridger Project

William L. Mathews, Idaho Director
Bureau of Land Management
334 Federal Bldg.
550 West Fort St.
Boise, Idaho 83702

RECEIVED
OCT 5 1971
U.S. Department of the Interior
Bureau of Land Management
Idaho State Office
Boise Idaho

Dear Mr. Mathews;

Thank you for sending a copy of the BLM's Environmental Impact (102) Statement for the Jim Bridger thermal-electric generation project. I appreciate the large amount of effort which has gone into the study to date, and into the preparation of this statement. I commend BLM for this, and hope that the effort to inform the public and to minimize the environmental impacts of this project will continue.

Please consider the following comments in the future evaluation of, and actions relating to, this project. I hope that some of the comments will be helpful, even though some of them I must of necessity pose in the form of questions for BLM, the other agencies involved, and the power companies. These comments are not to be interpreted as opposition to the project, but rather as a help in focusing attention on the potential environmental problems related to the Bridger project, assuring the minimizing of those impacts, and in raising basic questions relating to similar future projects while there is still time to consider them.

The IEC is of course concerned primarily with efforts to protect the existing high quality the environment in Idaho, but we are also interested in national legislation, policies, and general attitudes which will affect the future of the environment in both Idaho and the nation. The air pollution from the Bridger plant may not directly affect Idaho significantly, as it will probably be dispersed eastward by prevailing winds into the Cheyanne-Denver area. It may be that the transmission lines will constitute the only observable environmental impact in Idaho. However, we believe that some serious questions are posed by the Bridger plant and other future generation plants, particularly in light of the useful but sad experiences we are now getting from the larger fossil fuel plants in the Southwest.

It has also become more apparent lately that the Northern Rocky Mountain region, roughly the area of Idaho, Montana, and Wyoming, represents perhaps the least spoiled area in the contiguous 48 United States. The value of retaining this distinction, both to the residents of the region and to the nation as a whole, is a valid consideration. Certainly, most people would agree that any development there with potential for serious and adverse environmental impacts should be approached very cautiously. We should apply our past experiences of random development in this country to future considerations for more development; in particular we should be able to learn from the environmentally-expensive past lessons.

The Jim Bridger project, jointly owned by the Idaho Power Company and the Pacific Power and Light Company, will eventually involve these primary components:

1. An electric generating plant 35 road miles northeast of Rock Springs, Wyo., with three 500 megawatt units, each burning 250 tons of coal per hour.

2. A nearby strip mine of 5000 acres.

3. A 36 inch pipeline 42 miles long, carrying 40 cubic feet of water per second from the Green River to the plant for cooling purposes.

4. Three 345 KV transmission lines extending westward 235 miles to substations near Pocatello, American Falls, and Idaho Falls.

The environmental impacts which appear to be most serious involve air pollution, soil disruption, and transmission line effects.

Air Pollution

There are too many unknowns regarding air pollution which will be produced from the Bridger plant for us to be complacent. Concerning disbursement of emissions, the BLM 102 statement says "The ultimate fate of the emissions cannot be predicted with information currently available." (33) (Note: Unless otherwise indicated, quotes which follow are from the BLM 102 statement, and numbers in parentheses refer to pages in it.)

Nor is much known about the expected effects of those emissions. "Stack emissions are expected to have some adverse impacts on the environment; however, a more accurate delineation is not possible until studies currently underway are completed and data is available for analysis." (62) The letter from the Environmental Protection Agency, included in the BLM 102 statement, remarks that "The purposes of the Environmental Surveillance Program are not sufficiently described." The enclosed letter from the Wyoming Department of Health and Social Services states "Our present program of air quality surveillance does not include comprehensive stack sampling capabilities."

Further: "In the absence of precise design criteria, it is difficult to adequately assess these emissions. As soon as the Companies are able to provide meteorological data and their final designs, an independent analysis and predictive model will be prepared by the Bureau of Reclamation, working with the Tennessee Valley Authority's computers and programs." (30)

All this is not very reassuring, nor is this statement: "To date no monitoring programs to determine ambient air quality of the Rock Springs vicinity have been initiated by the State. It should be noted, however, that five western Colorado communities that have been tested (including the town of Rifle - 140 miles south of Rock Springs) failed to meet both Federal and State recommended levels of particulates in 1968 and 1969." (23)

The effects of the air pollution, not only on human health, but also on the desert ecosystem, would be good to know about, but .."Unfortunately, little is known about the effects of power plant emissions on rangeland ecology." (35) The study of the Red Desert, some 5 million acres lying east of the project, is now going on; what will be the effects of the air pollution on this area?

Brief Comparison of Air Pollution from the Four Corners Plant with the Bridger Plant

	Four Corners Plant[1]*	Jim Bridger Plant
Completion date and MW capacity of each unit	1 1963 175	1 1974 500
	2 1963 175	2 1975 500
	3 1964 175	3 1976 500
	4 1969 775	
	5 1970 775	
Total MW capacity	2075	1500
Tons of coal burned per day	25,000	18,000
% ash of coal	20.0	10.0
% sulphur of coal	0.6	0.7
Tons of particulate emission per day	300 to 400	8 to 13
% fly ash removal	About 80 for units 1, 2, 3, although they were designed for 87. For units 4, 5 - 97.	99.33 planned
Tons of sulphur emission per day	300	120 to 250

*Western Energy Supply and Transmission (WEST) Associates now has in operation the Four Corners Plant near the four corners area and the Mohave Plant in southeastern Nevada. WEST plans 4 more huge plants in the Southwest; the total capacity of these 6 plants would be nearly 15,000 MW.[1]

While the particulate emission from the Bridger plant is to be far lower than that from the Four Corners plant, the 8 to 13 tons of particulate daily is predicated on an electrostatic precipitator of 99.33% efficiency. What guarantee does the public have that the power companies will install equipment which will actually be this efficient?

While the particulate material may be more obvious, since it will probably reduce visibility, the SO_2 may be more serious from a health standpoint.

"Sulphur oxides are among the most damaging air pollutants. High levels of sulphur oxides have been linked to increased incidence of diseases such as bronchitis and lung cancer. In terms of damage to human health, vegetation and property, sulphur oxide emissions cost society billions of dollars annually."[1]

An annual average limit not to exceed 0.015 ppm of SO_2 has been recommended by officials of the former Air Pollution Control Administration, or about 45 micrograms per cubic meter ($\mu g/m^3$) HEW states that "Evidence shows that health may be affected adversely when the annual mean concentration of sulfur dioxide in the air rises above 115 micrograms per cubic meter or 0.04 parts per million.[2]

New Mexico has an annual mean limit of 65$\mu g/m^3$, and Colorado has an ambient air standard, unless otherwise indicated for specific locations, of 15$\mu g/m^3$ as a 24 hour maximum mean concentration. I do not know if either Wyoming or Idaho have yet set limits, although the ridiculously high figure of 0.2 ppm, or about 575$\mu g/m^3$ was being proposed for Idaho some time ago.

A sulfur dioxide concentration of 15$\mu g/m^3$ is equivalent to 0.07 tons per cubic mile. If one assumes a daily output of 150 tons of SO_2 from the Bridger plant, and if he assumes uniform distribution through a layer of air 1000 feet deep, then this amount would pollute the air to the limit of the Colorado standard over an area equal to that of Sweetwater County.

Another example which helps put the air pollution anticipated from the Bridger plant into perspective is given by comparing the various types of air pollution from that plant with that from the registered autos, buses, and trucks in the states of Wyoming and Idaho.

Comparison of Air Pollution from Motor Vehicles in Idaho and Wyoming with that from the Bridger Plant

(All amounts are in thousands of tons.)

Pollutant	Air Pollution in U. S., 1969*			From autos, trucks, & buses in Wyo. & Idaho#	Expected from Jim Bridger Plant@
	Total	From Transportation	From Fuel Combustion, Stationary Sources		
Carbon Monoxide	151,400	111,500	1,800	753	------
Particulate	35,200	800	7,200	5	3 to 5
Sulfur Oxides (Mainly SO_2)	33,400	1,100	24,400	7	44 to 95
Unburned Hydrocarbons	37,400	19,800	900	134	------
Nitrous Oxides	23,800	11,200	10,000	76	0 to 54
TOTAL	281,200	144,400	44,300	975	47 to 154

* Environmental Quality, second annual report of the Council on Environmental Quality, Aug., 1971, table 1, p 212.

# Calculated by using the fraction of U.S. motor vehicles in those 2 states multiplied by the respective figure under "From Transportation" column.

@ Based on the minimum and maximum figures given in the BLM 102 statement, p 32.

Soil Disruption

Hopefully, efforts to minimize soil erosion along both the pipeline and the transmission line will be made. The plan to minimize the amount of exposed soil at any one time at the strip mine sounds good. But what assurance does the public have that reclamation of the mined area will be done adequately? I am not aware that the state of Wyoming yet has an adequate strip mine reclamation law. Does the BLM presently have the authority to regulate this, even on that part of the mine which is BLM land? Will native plants be used to revegetate the mined area, or will exotic species be needed? If the latter, will those be likely to have any adverse impacts?

The estimate given (3) for the amount of coal in the 5000 acre area is 100 to 130 million tons, and it is stated that this is enough to operate the plant for 35 years. Yet at the rate of 250 tons per hour for each of the 3 units, this amount of coal would only last 16 to 20 years. Does the difference represent the "down" time of the generation units?

Transmission Line Effects

The effect of the transmission line on wildlife is of some concern. "Wildlife will be disturbed and temporarily displaced during periods of actual construction. Improved access to big game winter-use areas may be detrimental because of increased traffic disturbing the game populations. Harassment of game by snow machine users is a critical impact likely to occur." (43) Has anyone studied the effect of a large transmission line on wildlife in a similar type of terrain, so that we have a better idea of what to expect?

Numerous eagles, both bald and goldens, have been electrocuted by high voltage power lines in recent years. Is anything known about discouraging them from lighting on these lines, and if so, can it be applied in this case?

The Bridger project and the environmental impact statement bring up other considerations of a more general nature:

1. The "Growth-is-Good" Syndrome

Under the discussion of alternatives to the Bridger project, the BLM 102 statement notes that "Another would be not to construct the Jim Bridger plant and make no attempt to satisfy the projected power needs. Either alternative would have the effect of slowing down the Pacific Northwest economic growth, at least between 1970-1980." (6) Would this really be so terrible? When will economic growth in the Northwest, and in the U. S., stop? It surely must sometime, whether we wish it or not, for we are reaching limits, both in regard to resources available and especially in regard to the ability of the environment to absorb our pollutants. Evidence is beginning to indicate that the traditional economic growth associated with material resource development may be causing more problems than it is solving.[3] How much growth do the people of Sweetwater County really want, once they are aware not only of the benefits of such a development as the Bridger project, but also the costs, including the impact of a construction boom on housing, transportation, and schools? (39,48)

2. Electrical Power Growth

The generation and consumption of electricity represents another type of growth which cannot continue many more decades at the present rate of increase, which causes a doubling about every 10 years. By the year 2100, there would not even be space available for the generation plants alone.[4]

The following comments by Norman Brooks, professor of environmental science and civil engineering at Caltech, are relevant:[5]

> "... I do not think we must plan for whatever the demands may be; on the contrary, it will be necessary for society to control this growth rate to keep energy and its environmental effects within tolerable limits."
>
> "Our most powerful tool for environmental control in the next few decades is a drastic reduction in the rate of increase of consumption. Society must set limits on the total release of heat and all other contaminants to protect the quality of our finite environment."
>
> "The 'scarcity' of the environment is now replacing the scarcity of fuel as the critical constraint in growth of the energy industry."
>
> "Now we have passed the last frontier of the infinite environment concept. We must stop talking about meeting the demand for energy and instead devise ways to allocate a limited potential supply and to change people's attitudes toward energy. The first step is to reduce the annual rate of increase..."
>
> "It's not a question of whether it is 'even possible'; it's a necessity to develop such policies if we want to survive this energy 'explosion'. It's not a case of saying the public is not ready for growth control. It's time for the technologists to say, 'You must recognize the limitations of your environment and live within your environmental means."

It is true that the public 'demands' electricity, but part of that demand, which results in a great waste of electricity, is a result of advertising of electricity by the power companies. The advertising of electricity must cease.

3. Lack of Regional Land Planning

The Bridger project represents an excellent example of a development with serious potential environmental impacts which is upon us before we really considered how we wished to use the land and related resources, before we really decided, as a regional public, whether we wanted it or not; and indeed before we were even asked if we wanted it or not.

4. "Least Objectionable Site" Principle

The Bridger plant is to be where it is, it seems, not only because of the economics involved in the location of the coal, but also because of the absence of reasonable air pollution regulations and of a low population density (11), where few people live near the plant. This is also true in the case of the Southwest power plants.

5. Self-perpetuation of agencies at the Expense of the Environment

In the case of the Southwest power plants, the Bureau of Reclamation has a less than environmentally-healthy role.[6] A recent article in Environment magazine points out that: "The most complicated and conflicting involvement, however, is with the Bureau of Reclamation, which has the assigned task of promoting the growth of regional economies through optimum development of water and related land resources. Its dams produce hydroelectric power, its water allocations cool the WEST (Western Energy Supply and Transmission Associates) thermal plants, its water contracts with other WEST members stipulates the manner in which stack emissions will be controlled - and it will be the largest single consumer of power from the Navajo Plant now under construction, using, in conjunction with its Central Arizona water project, 24.3 percent of the 2.3 million kilowatts to be generated by this plant."[1]

The Council would like more details about the involvement of the Bureau of Reclamation, and any other agency which may be promoting the Bridger project.

6. Public Information and Involvement

The BLM 102 statement mentions several meetings held relating to the project (65). To my knowledge, none of these were widely publicized. The first 2 meetings were for agency people only. The next 2 meetings involved an inspection of the site for "all interested parties" in Wyoming and in Idaho. Did any conservationists attend either of these 2 meetings? Were any invited? The 102 statement also lists federal agencies, state agencies, and local and private entities (66,67) which were consulted or were in attendence at meetings related to environmental aspects of the project, but there are no environmental organizations nor environmentally-minded individuals in the list of the latter category, but rather those groups which would be expected to be development-minded rather than environmentally sensitive. The public must be informed and allowed to become involved in such major decisions as this at an early stage, and not after it is too late to even consider what may have been some of the very basic questions.

7. The Future

How well we minimize the adverse environmental impacts of the Bridger plant, and how well we take into serious consideration some of the basic questions relating to future power plants, will influence our environmental future in the Northern Rocky Mountain region. When will the "need" for more electricity require the construction of another plant in the region, perhaps even larger than the Bridger? Will we be faced in a few years with another "Four Corners" fiasco in Wyoming? There are an estimated 23 billion tons of strippable coal in Wyoming (12); how soon is it to be torn up and converted into air pollution, heat, and electricity?

Before the first unit of the Bridger plant is operation in 1974, the following environmental considerations would be desirable:

1. Current studies on expected stack emissions should be completed, and results publicized in a readily digestable manner.

2. A study of the existing air quality in the Rock Springs area should be done.

3. A brief study of the effects of a fossil fuel plant on the high, northern desert should be made.

4. Hopefully, Wyoming (and Idaho too for that matter) will pass adequate pollution regulations on particulates and SO_2. Some good strip mine reclamation legislation is also needed.

5. The power companies should be encouraged to make every effort to install pollution abatement equipment which does in fact remove at least 99.33% of the particulate matter; they should begin planning for the installation of SO_2 abatement equipment as soon as it become available.

6. We need to know more about the effects of a large transmission line on wildlife in the northern desert-forest region, including ways to keep eagles away from them.

7. Electric utilities should be encouraged to stop advertising.

8. Information should be made public on the involvement of any government agencies which are promoting this project.

9. Public information meetings should be held in the near future, with some of them in the larger cities in the region.

References:

1. Craig, Roy, "Cloud on the Desert", Environment Magazine, July-Aug., 1971.

2. "Danger in the Air; Sulfur Oxides and Particulates", U. S. Dept. of HEW, NAPCA publication No. 1, May, 1970.

3. Forrester, Jay W., "Counterintuitive Behavior of Social Systems", Technology Review, Jan., 1971.

4. "The Space Available", A report from the Committee for Environmental Information, Environment Magazine, March, 1970.

5. Brooks, Norman, "Energy and the Environment", Engineering & Science, Jan., 1971.

6. Josephy, Alvin M., Jr., "Murder of the Southwest", Audubon Magazine, July, 1971.

Thank you for the opportunity to comment. I'm afraid I have gotten more involved, and said more than I had originally intended.

Sincerely,

Gerald A. Jayne

Gerald A. Jayne
President, IEC
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Idaho Falls, Idaho
83401

LEWISTON MORNING TRIBUNE
Opinion
EDITORIALS
LETTERS
COLUMNS

MONDAY, SEPT. 6, 1971

There Goes The Old Reservation

Financial and industrial publications are full of news about the latest western boom: strip mining for coal. The eastern United States has just about run out of low-sulphur coal, the kind that pollutes the air least when it burns and the only kind that can meet the new national air quality standards, but vast quantities of low-sulphur coal lie under the sagebrush, wheat and grass of the western states.

There is some irony in the fact that the fight against air pollution has led to a spreading pollution of the land, but there it is. Thanks to stiffer air quality standards in the East, it has become economical for the first time to strip the coal fields of the West and haul the fuel to hungry eastern markets. And because it is economically feasible to strip the land, mining companies and power firms are rushing to acquire mining leases in Colorado, Wyoming, Montana, New Mexico, Arizona and Nevada. And here is another irony: Much of the land under lease for strip mining is on Indian reservations, presumably under the control of people whose tradition has been to hold the earth as sacred. Although Indians have harshly condemned the white man's rape of the land, Indian leaders now are permitting the destruction of much Indian land with the same goal that motivated their white brothers: profit.

While profit is the basic motive, the strippers' argument for public consumption is that coal is needed to produce electricity to meet the inevitably increasing demands of a growing economy. Production of electricity is the chief use of the coal, to be sure, but there is another less destructive way of producing it. Unfortunately, coal is cheaper than nuclear power at the present state of technology, and as long as coal abounds, why invest in nuclear stations? The president of Pacific Power & Light Co. is quoted by *The New York Times* as saying his firm plans to go slow on development of nuclear power because "we've got coal running out of our ears."

And while it is true that the use of electricity is increasing, it is also true that the demand for juice is being stimulated by the companies that sell it. The utilities spend millions of advertising dollars every year exhorting us to buy electric air conditioning for our homes and install power-hungry floodlights around our farms, and then they argue that they have to build more dams or strip-mine more coal in order to supply the "demand."

The way to curb the spiral is not to go on heroically meeting the ever-increasing "demand" for electricity, as though the escalator were beyond human control, but to discourage it. The power companies say that even if we stabilize the population here in the Pacific Northwest, our demand for electricity will continue to increase. It will do that only if we let it—that is, if we continue to give the responsibility for planning power needs and production to those who stand to profit from power sales.

The rate at which we consume electrical energy in the future, and the way we produce it, is going to determine the nature of our environment to a marked degree. Since the kind of environment we live in will have much to do with the length and quality of our lives, we should not make it subject to the corporate needs of the Washington Water Power Co. or Pacific Power & Light.

The history of strip mining in the eastern United States, with its water poisoning, erosion and destruction of whole mountains and valleys, constitutes one of the most sordid chapters in the long chronicle of our misuse of the land. The blight must not be allowed to spread across the West on the assumption that some natural law requires us to use more electricity every year than we used the year before. The spiraling demand for electrical energy is not inevitable. We are not committed to go on requiring power in larger amounts until the land is laid waste, the air poisoned and the waters barren of life. No matter what the power companies say, some things could be done to bring some balance into play.

A governmental agency not beholden to utility stockholders could be given the responsibility of planning actual power needs and the best means of power production. The Atomic Energy Commission could do much more than it has to encourage the development of safe, low-cost nuclear power stations. The mining laws inherited from the 1870s could be rewritten to eliminate the mining industry's first priority on the land. State legislatures could more strictly control the operations of dredgers and strip miners and require the rehabilitation of disturbed lands and waterways. Public schools could begin teaching the economics of survival, including at least one course in the true cost of electricity and another in the high cost of reproduction. The new stratum of young voters, most of whom are less hobbled than their fathers by the economics of the industrial revolution, could focus their political power on the issue of land preservation and make it count. And the Indians of the western plains, whose treaties grant them more control over their lands than most of us have, could stop signing strip-mining leases.

The last may be crucial. If the reservations aren't safe from the power shovel, what chance has the rest of the country got? — L. H.

Lessened Energy Demand Needed

STM 7/23/71

A proposal to establish a nationwide electric power grid has popped up again, this time in the form of legislation introduced in Congress.

The idea of a nationwide power grid first was broached back in the late 1940s and early 1950s. The advocates were supporters of public power. In fact, they envisioned a grid that would result in the nationalization of the private power industry.

Sen. Lee Metcalf, Montana Democrat, a strong public power advocate and bitter opponent of private electric utilities, said his proposal for a nationwide grid would "infuriate private utilities."

But the private-public power confrontation has virtually ended. Power is needed no matter whether it is generated by public agencies or private utilities. The spread in the cost of generation by new facilities, whether public or private, is not so great anymore.

In the West, at least, public and private agencies already are tied together. Idaho Power electricity flows into Washington and Oregon, Montana and Utah. When its Jim Bridger plant in Wyoming is completed, it will send one million kilowatts into Portland.

Bonneville Power flows to California and Arizona. Montana power flows into the Missouri Basin grid and into the Dakotas. Everything west of the Mississippi has ties. The East certainly must have an interchange of electric energy. And it makes no difference whether it is public or private.

A national grid, particularly for emergency purposes, does make sense. Electricity is moved long distances, not directly, but by exchange and displacement. So while it is not practical to move Idaho or California power directly into New York state, the exchanges of electricity across country would accomplish the same thing.

The congressional backers of the nationwide grid hold that the necessary new power plants could be built away from population centers and thus contribute to a curb on pollution.

The environmentalists are fighting new power plants wherever they may be planned. There is a stigma attached to power plants, be they hydro, or nuclear or fossil fuel fired.

The nation's demand for energy is insatiable. The demand for a decent environment also is reaching the edge of insatiability. The greater need is to solve this problem before $8 billion (as estimated by Metcalf, et al) is spent on a nationwide grid.

It appears that the solution will require a diminishing need for energy, even if it takes population control, if the nation is truly going to meet its environmental goals.

Strip Mining, Power Plants

Habitat Disaster Foreseen in West

IDAHO
8/25/71 STATESMAN

LANDER, Wyo. (UPI) — The former head of the Wyoming Outdoor Coordinating Council warns of "environmental degradation on a scale never anticipated" unless innovative action is taken to control coal and uranium strip mining and establishment of power plants.

But Tom Bell said of all the Rocky Mountain states, only Colorado Gov. John Love has begun questioning the validity of continuing uncontrolled growth.

He said Governors Stanley Hathaway of Wyoming and John D. Williams of Arizona "are sneeringly contemptuous of the environmental considerations of impending growth and development."

Montana's governor "gives lip service but opts for growth," he said, adding New Mexico's Bruce King and Idaho's Cecil Andrus "seem to be too new at their jobs to have been able to wrestle with serious population and environmental problems."

"Today the states of Montana, Wyoming, Colorado, Utah, New Mexico and Arizona find that digging into the earth's surface has literally opened up Pandora's Box," he said in the Wyoming Wildlife Federation August Newsletter.

"The huge deposits of coal mean strip mining on an incomprehensible scale and along with that the siting of huge power generating plants. As if to add insult to injury, both Wyoming and New Mexico have huge deposits of uranium which entail strip mining — again to provide fuel for power generators."

He said such developments bring more people and more problems which add up to "environmental degradation on a scale never anticipated by the residents of the wide-open spaces."

Power-Environmental Conflict Grows

STM 6/23/71

STEWART UDALL

Many of this summer's power blackouts or brownouts will be directly related to the growing crunch between environmental activists and the expansion plans of electric utilities. Indeed, it is clear that more than any other industry, electric power will be the focus of bitter public disputes in the years ahead.

Last month's Senate Interior Committee hearings on the construction of six new coal-fired generating stations in the Southwest threw the power-environment collision into stark relief. With great vigor, utility executives pressed home their point that the soaring demand for electricity is not only inevitable but desirable.

THIS CLASSICIAL pro-growth argument was bluntly challenged not only by environmentalists but by men who normally view themselves as boosters. "Europeans are managing to live reasonably affluent lives on less than half the per capita power consumption of this country," said Walter Brown, president of the Mancos County, Colo., Chamber of Commerce.

He has a valid point. Europeans do use much less power than Americans, and on the whole, they live longer, healthier lives. They also waste far less of the energy they have. Restrained personal consumption and wise industrial practices (European aluminum companies, for example, use less than half as much electricity as ours) help them get by on leaner energy budgets.

Without a doubt, the U.S. power industry is caught in a "damned if it does, damned if it doesn't" bind. The same public that rebukes it for its pollution also sets up an outcry when the lights go out. But this crunch is, in part, of industry's own making.

The utilities have oversold and overadvertised all-electric living. They have not (New York's Con Edison is one exception) called for more prudent consumption. Above all, they have doggedly refused to undertake a major, costly effort to develop cleaner sources of power.

SO LONG AS utilities plunge down this path, they must expect a series of increasingly jolting collisions not just with card-carrying conservationists, but with all Americans who seek a better environment.

Disturbingly, neither the utilities nor their government allies seem fully aware of this predicament. Two weeks ago, President Nixon launched a major new drive for "clean" energy. His main initiative is an all-out push by the Atomic Energy Commission (AEC) to build a demonstration model of a liquid metal fast-breeder nuclear reactor by 1980. But once again -- as recent events have demonstrated — the President's plan is stirring up far more controversy than it resolves. For example:

--Fast-breeder reactors will create and use plutonium, one of the world's most dangerous radioactive elements. Plutonium is extremely toxic in tiny amounts, induces cancer in test animals, and retains its radioactivity for thousands of years. It is, indeed, the "fuel" for hydrogen bombs.

—No environmental study of the whole fast-breeder program is planned. In his energy statement, President Nixon stated that only the pilot reactor would be so studied. The Scientist's Institute for Public Information and the Natural Resources Defense Council have launched a lawsuit against the AEC to test the environmental shortcomings of this program. The suit epitomizes the concern of many prominent scientists over the government's gung-ho commitment to fast-breeder reactors.

—The new federal program contains zero or miniscule funding for truly clean power sources such as fuel cells, solar energy and geothermal energy.

AS A DISTURBING backdrop to these long-range disputes, the AEC has discovered that the conventional nuclear power plants which it licenses face a grave safety problem.

On April 29, AEC chairman Seaborg wrote the Joint Committee on Atomic Energy that "some problems have been encountered . . . which indicates the need for a more rigorous effort in this (reactor safety) area." The Joint Committee, which discussed Seaborg's letter in a secret session on May 3, still refuses to air the crisis publicly.

The facts are, however, that at a test facility in Idaho Falls last winter, the AEC learned the emergency cooling systems on current nuclear reactors have very severe defects. Six separate tests showed that 90% of the emergency cooling water in a model reactor failed to reach the superhot core. Had this chain of events occurred in one of the 22 existing full-scale reactors, the subsequent melt-down would probably have led to radioactive contamination over a wide area.

Nonetheless, the AEC reactor safety budget is meager, and while the agency has delayed permits for pending reactors, it does not plan to test the emergency cooling system of a working power plant until 1975 — when over 80 nuclear reactors will be on the line. Six environmental groups have sharply criticized this go-slow policy and have asked President Nixon to order hearings on reactor safety.

So, as we said, the power-environment crunch is growing. All of us had better re-examine the assumption that we can have all the "cheap" energy we need without paying a price for it.

The West's Frontier Coal Rush

I.F. Post Register 9/12/71

In the days of the early West, the resources were there for the taking, and the government lent its support with the mining act of 1872, the homestead act, the banishing of Indians to reservations, and many another government action designed to move along even faster a pellmell frontier taming. The nation wanted the foodstuffs, the ore, the cattle, and the lumber for its burgeoning growth and the people needed the land.

The landrush left its scars in dredged out streams, gaping placer mined valleys, and in a public range which had been critically overgrazed for too many years. You can see them in Idaho. Most of Idaho's critical ranges for wildlife and livestock are the heritage of this era's heedlessness.

In the same era, there were also the good, far-seeing stewards of the land, too. Many of these put water to productive use and reclaimed the desert so that the West could have its growth leverage. These good land managers have handed down the fruits of their pioneering labor to succeeding generations.

But the land heals slowly. And the recognition of the abuse over too much of the public lands has come just as slowly. But this recognition has arrived.

But now a new "land rush" has come to the west of 1971 . . . The coal rush, and to a lesser extent, the lumbering rush.

The eastern United States has just about run out of low sulphur coal, the kind that pollutes the air the least when it burns. On the coal front, the east's abuse of the land has been decidedly worse than even the dredgers and placer-miners who sent the soil forever down to the sea in the valleys and mountains of the west. Appalachia is a stark monument to the kind of stewardship the east has perpetrated in the name of progress.

The coal miners, and the electric companies have now "discovered" the West. There are vast quantities of low sulphur coal under the plains and mountains of the west. In Montana, Wyoming, Nevada, Arizona and Colorado, the utilities have "found" their 1971 stake.

In the most serenely attractive area of the southwest, the Parks-laden Four Corners area, electric plants burning coal from nearby Indian reservations have already started. More are to come. The principal market is many miles away — principally southern California.

And strip mining and open pit mining is the kind of mining that is largely being employed — the most devestating to the land.

A. J. Teske, Boise, executive secretary of the Idaho Mining Association, in a recent Idaho Falls talk, noted that strip and open pit mining are becoming more and more necessary to achieve the economics necessary to provide the ore. Mr. Teske said that mining research has also allowed recovery of ores through these methods with ore densities which did not permit economical mining before. He also pointed out that withdrawal of lands for wilderness and other reasons is also narrowing the mining choices. (The Wilderness act, however, allows mining exploration under a definite regulatory framework until 1982 but the act does not say what will happen to mining opportunities after that.)

Stated the Lewiston Morning Tribune newspaper recently on this topic:

". . . The blight (strip mining and its history in the East) must not be allowed to spread across the West in the assumption that some natural law requires us to use more electricity every year than we used the year before. The spiraling demand for electrical energy is not inevitable. We are not committed to go on requiring power in larger amounts until the land is laid waste, the air poisoned and the waters barren of life. No matter what the power companies say, some things could be done to bring some balance into play.

"A governmental agency not beholden to utility stockholders could be given the responsibility of planning actual power need and the best means of power production. The Atomic Energy Commission could do much more than it has to encourage the development of safe, low cost nuclear power stations. The mining laws inherited from the 1870s could be rewritten to eliminate the mining industry's first priority on the land. State Legislatures could more strictly control the operations of dredgers and strip miners and require the rehabilitation of diturbed land and waterways. Public schools could bring to teaching the economics of survival . . . and the Indians of the western plains, whose treaties grant them more control over their lands than most of us have, could stop signing strip mining leases . . ."

The AEC and its breeder reactor concept, and later, in its fusion breakthrough, can be the ultimate answer.

The problem is that at this precise time, electric utilities must elect coal for the best economics of the day. But should we go pellmell on coal now and its air-fouling potential, low sulphur or not, and irrespective of the sincere efforts of utilities to trap and filter smoke releases? What are we willing to pay for, not only when the breeder reactor is perfected, but right now when water reactors are available, in slightly higher power costs?

Yes, we must have electricity. But how do we get it is the critical question. What value do we put on our livability and the priceless purity of western living? What do we pay less for in the name of clutter?

Increased pressure is also being placed on western forests for logging. Private lands and out-of-west sources are not available in the same order of production so the west is being looked to supply the increased demand on an ever increasing scale. Because of the nation's housing needs, even an executive order from the White House is looking over the shoulders of the Forest Service and the Bureau of Land Management in pressurizing more stake-outs for lumbering. Lumbering is a legitimate function of public land production, of course, but one of the chief worries is that the largely steep-mountained west does not lend itself in some areas to volume logging.

And volume logging, like volume mining, is naturally important to the logging industry There are places in Oregon and Washington and Northern Idaho, for example, which lends itself to this kind of logging. But there are many another national forest areas in the West which do not. The clearcutting abuses in steep sided mountains in Montana and Wyoming are vivid cases in point. This should not indict all clearcutting which is needed within the framework of logging choices. These are apparently extraordinary abuses. It should not reflect the general stewardship of the Forest Service.

But it should alert westerners that the pressure game is on in the West, and that care must be taken that we always log where we should and in the manner that will truly achieve a sustained-yield. It must also recognize other public values in the same logged land. Logging is an important function of forest management. It also provides in-forest values, like new Elk pastures. But we don't know enough yet on how to do it better and what other impacts it may have. We need to accompany our logging not only in the right places and in the right manner, but with more research.

The West's Frontier Coal Rush

[illegible]

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WYOMING RECREATION COMMISSION

604 East 25th Street, Box 309, Cheyenne, Wyo. 82001
Telephone: Area Code 307 – 777-7695

LYLE BENTZEN
President

STANLEY K. HATHAWAY
Governor

PAUL H. WESTEDT
Director

COMMISSION OFFICERS

FLOYD BARTLING, Vice President
Hilltop Addition
Douglas 82633

BILL NATION, Treasurer
2221 Van Lennen Avenue
Cheyenne 82001

MEMBERS

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Mrs. Robert Frisby
2007 Newton Avenue
Cody 82414

Marvin Harshman
1507 W. Spruce
Rawlins 82301

Jack D. Osmond
P. O. Box 216
Thayne 83127

Albert Pilch
1800 Morse Lee
Evanston 82930

Duane Redman
Dubois 82513

November 2, 1971

Routing 11/4 Initial & Date
.... SD ....
.... ASD ....
....2.... PCS ....[illegible]....
.... CPA ....
....1.... RES. ....NH....
.... TECH S. ....
.... MGMT. S. ....
....
LEAD RESP. ....1....

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

RE: 1791 (911)

Dear Dan:

Thanks for the opportunity to review the draft Environmental Impact Statement for the Jim Bridger Thermal-Electric Generation Project. It has been studied by several members of my staff and they share my view that it is a complete and objective document. The Bureau of Land Management is to be congratulated on their knowledgeable and realistic approach to environmental concern.

We will, of course, be most interested in watching the project develop to determine any major shifts in population, either in numbers, in location or in socio-economic make-up, that will utlimately effect the recreational needs and demands of the area. At this point in time we see no great need for extensive recreational developments at or near the plant site, but recognize that changing conditions could create a demand for new facilities once the plant's operation is stabilized.

Our grestest concern lies with the potential disruptive impact of the power and pipe line construction. We appreciate your concern for the need to protect scenic, historic and archaeologic values along these right-of-way corridors and fully encourage you to make that concern keenly felt during the construction phases. We trust that the corridors will not become road blocks to crossing recreational roads and would suggest, in fact, that consideration be given to using such corridors for recreational activities that do not require natural settings. Such uses as snowmobile trails and off-road vehicle cross-country courses come to mind.

Please call on this office for whatever assistance we can offer toward the planning or provision of recreational facilities deemed desirable for this new facility. Again, thanks for the opportunity to review this document and for the change to become involved in future environmental and recreational planning for the project.

Sincerely,

Paul

Paul H. Westedt
Director

"*Dedicated to the Development of Public Outdoor Recreation*"

November 2, 1971

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

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Sincerely,

Paul

Paul H. Westedt
Director

THE UNIVERSITY OF WYOMING
PLANT SCIENCE DIVISION
COLLEGE OF AGRICULTURE
AND EXPERIMENT STATION
AGRICULTURAL BUILDING
LARAMIE, WYOMING 82070

MAILING ADDRESS:
UNIVERSITY STATION
P. O. BOX 3354
LARAMIE, WYOMING 82070

RANGE MANAGEMENT
SECTION

5 November 1971

Routing 11/8
SD
ASD
1 PCS TWR
OPA
2 RES. Letson
TECH S.
MGMT. S.
LEAD RESP. 1

Tom Rodda
Land Use Planner
Bureau of Land Management
Federal Building
Cheyenne, Wyoming 82001

Dear Tom,

I have partially browsed the 2nd draft of the Environmental Impact Statement which was sent to Dr. Beetle. After a quick reading, I have only 1 comment to make and that pertains to the 4th paragraph on page 1 of the "Matrices and Impact Assessment Statements." In this paragraph referring to atmospheric quality, it appears that those who drew up this draft believe that nothing can be accomplished with the fly ash other than to deposit it back in the coal pit and cover. From some very preliminary research with the Dave Johnston fly ash, I believe that the material can be used to support vegetation with no addition of soil and very little or no addition of fertilizer. Likewise, it would appear that the fly ash may be valuable material to use in neutralizing acid spots in the spoil banks prior to any revegetation effort.

In general, the Impact Statement follows the line of thinking which is prevalent regarding strip mine spoil banks and that is that the area affected should be returned to approximately the original contours and condition prior to mining. I personally feel that this is a false concept and that in many instances returning to the original contours would lessen the value of the area. To support this view I would like to cite the example of permanent watering ponds at the Kemmerer Coal mining area which if you are going to return the area to approximately its original condition would need be filled in and covered with almost barren rock and soil.

I would like to see a more positive approach to the reclamation of spoil banks with our state laws and our thinking geared to leaving the area in as good or better condition as it was prior to mining. Thanks for the opportunity to make comments on this statement and I will be looking forward to receiving a copy as per my last letter.

Sincerely yours,

Robert L. Lang
Professor
Head, Range Management Section

March 3, 1849

United States Department of the Interior
OFFICE OF THE SECRETARY
MISSOURI BASIN REGION

BUILDING 67, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY REFER TO:

Routing 11/10/71 Initial & Date
SD
ASD
1 PCS
OPA
2 RES.
TECH S.
MGMT. S.
LEAD P SP.

November 8, 1971

State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

The attached comments are provided, concerning your draft environmental statement on the Jim Bridger Project in Wyoming you sent with your letter of October 26, 1971.

Sincerely yours,

D. P. Shoup
Field Representative,
Missouri Basin Region

Enclosure

UNITED STATES
DEPARTMENT OF THE INTERIOR
MISSOURI RIVER BASIN PLANNING OFFICE
P.O. BOX 428
OMAHA, NEBRASKA 68101

DEPARTMENT OF INTERIOR
RECEIVED
NOV 8 - 1971
FIELD REPRESENTATIVE
MISSOURI BASIN REGION
DENVER, COLORADO

IN REPLY REFER TO: M-100

November 5, 1971

To: Field Representative, Denver

From: Missouri River Basin Planning Officer

Subject: Draft Environmental Statement on the Jim Bridger Project, Wyoming

Responding to your request I have carefully reviewed the draft of subject statement. In doing so I have kept in mind the guidance given us in the recent Interior Field Committee meeting, particularly for the major items outlined to test the adequacy of environmental statements as the basis for decisions.

Certainly the Jim Bridger Project represents a large complex of facilities having many implications for environmental impact. Obviously there are many technical specialties represented in the "second draft" of the statement where I am in no position to judge the criteria and assurances given for these special problem areas. However, considering the list of agencies and others from whom comments are now solicited, including many in our Department, these phases should receive adequate checking.

It is apparent that the two power companies have recognized the need therefor, and have drawn heavily on the affected agencies of the state and federal governments, and on other specialists in checking plans and locations for the major facilities. In this process it is my appraisal that a very painstaking and competent job has been accomplished in the background studies and in pointing up the environmental considerations. The statement covers both positive and negative impacts, the natural processes and man's proposed adjustments, the knowns and unknowns, the unavoidable and irreversible effects, the time factors associated with effects, and the alternatives. The coverage in the draft statement to me appears very thorough in presenting analyses that permit but do not actually include the environmental decisions. This is especially true in the application of the matrix system in appendices A, B, and C.

Overall and insofar as I could checklist items of environmental concern, the statement appears quite adequate for the purpose, and I feel it is fully objective and realistic in pointing up all relevent factors, favorable and adverse, With the completion of studies in progress, and their findings, with continued cooperation of the many affected agencies and entities already involved in the details of facility locations to minimize environmental impacts, and with recognition for the specific environmental standards and controls pointed up and which should be imposed,

there appears to be an adequate basis for environmental decisions. I do note the concern expressed in June 1971 by our USBR office in Salt Lake City for inadequacy of many aspects of what I presume to be the "first draft" — hopefully those specific deficiencies have been overcome. It would seem that more attention should be given in the statement to the specific plans for disposal of any waste waters and blowdown residues. Along with the recognition now given to the serious impact of any runoff from the liquid blowdown effluent, there is the question of assuring that such effluents will not enter any streams (physical control); also, that there will be surveillance for possible groundwater contamination by wastes returned to the mine pits, and corrective action (as by treatment) if adverse groundwater quality trends should be noted over time. On page 25, line 8 under "C", the phrase "failed to meet" raises a question—did their level of particulates show values well below the standards or above them?

Near the front of the statement I note the list of Interior Department agencies—also the list of agencies for "consultation and coordination" shown on page 72. While the environmental statement was prepared by BLM, in light of its heavy involvement, should it too be listed?

I am returning the copy of statement for your further use. However, should an extra show up, I would like to have one for future reference.

Paul L. Harley

Paul L. Harley

Enclosure

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

NOV 16 1971

Routing	11/17	Initial & Date
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/	RES.	[illegible]
	TECH S.	
	MGMT. S.	
LEAD RESP.	/	

State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

This is in response to a letter dated October 26, 1971, to Mr. Joseph J. DiNunno from the Acting Associate Director, Bureau of Land Management, U. S. Department of the Interior, concerning the draft environmental statement for the Jim Bridger Project, Wyoming. We have reviewed the statement with respect to radiological matters and have no comments to make.

Sincerely,

L. Manning Muntzing

L. Manning Muntzing
Director of Regulation

cc: Mr. Timothy Atkeson
Council on Environmental
Quality (10)

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL BUILDING, 19th AND STOUT STREETS
DENVER, COLORADO 80202

REGION VIII

IN REPLY REFER TO:
8SDA

November 22, 1971

RECEIVED
Bureau of Land Management
State Director
NOV 24 1971
Cheyenne, Wyoming

Routing	11/24	Initial
	SD	
	ASD	
2	[illegible]	
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1	RES.	
	TECH S.	
	MGMT. S.	
	LEAD RESP.	1

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

Subject: Draft Environmental Statement - Jim Bridger Project, Wyoming

We have reviewed the subject draft Environmental Statement which was transmitted to our Washington D.C. Office by your letter of October 26, 1971.

This draft Environmental Statement provides adequate information to enable us to generally evaluate the urban environment impact of the proposed project.

Our review has revealed no basis for reservations or comments with regard to any adverse impact which this project may have on the urban environment.

Sincerely,

for John J. Wilder
Assistant Regional Administrator
for Community Planning and Management

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
XXXXXXXXXXXXXXXXXXXX
REGION NINE
Wyoming Division Office
P. O. Box 1127
Cheyenne, Wyoming 82001

Routing	11/26	Initial & Date
	SD	
	ASD	
2	PSC	
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1	FES.	
	TECH S.	
	MGMT. S.	
LEAD RESP.	1	

November 24, 1971

IN REPLY REFER TO:

Bureau of Land
Management Environmental
Statement Review

File: 400.(1)

Mr. Daniel P. Baker
State Director, Wyoming
United States Department of the Interior
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming

Dear Mr. Baker:

We have reviewed your draft environmental statement for the Jim Bridger Thermal-Electric Generation Project and have the following comments.

It appears a considered effort was made to minimize the aesthetic effects of the transmission lines for the subject power plant. We therefore have no comment or suggestion for the improvement of the proposed project.

Sincerely yours,

John M. Demmer
JOHN M. DEMMER
Division Engineer

THE STATE OF WYOMING

Department of Health and Social Services

Division of Health and Medical Services

STATE OFFICE BUILDING CHEYENNE, WYOMING 82001

November 30, 1971

Routing — Initial & Date
SD
ASD
2 PCS
OPA
1 RES.
TECH S.
MGMT. S.
LEAD RESP. 1

Daniel P. Baker
State Director
Bureau of Land Management
Post Office Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

We wish to acknowledge receipt of the Jim Bridger project draft and environmental statement.

The differences in emission projections have been noted, and we recognize that somewhat different assumptions may be chosen which influence computation parameters for such estimates. The Wyoming Air Resources Council cannot recommend courses of planning in such matters since the Wyoming Air Quality Act does not grant authority to limit construction or modification of such facilities. Our requirements are based only on emission and ambient standards which must be considered in design and planning by industry. We cannot intervene in the planning to recommend specific courses of correction action such as those specified by consultants or plant design staff.

We wish to invite your attention to Chapter VI, Utility Environmental Production Rules of the Wyoming Public Service Commission relating to generating plants. We suggest that this agency may wish to comment on these matters as the rule applies to planning and construction requirements.

We will be directly involved in ambient and source oriented evaluations after plant startup, but consider the planning, design, and construction to be more direct responsibilities of the facility management and equipment vendors.

Very truly yours,

Robert E. Sundin

Robert E. Sundin
Director
Air Quality Section

RES:dh

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
ARCADE PLAZA BUILDING, 1321 SECOND AVENUE
SEATTLE, WASHINGTON 98101

November 29, 1971

Routing 12/2		Initial & Date
	SD	
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2	PCS	[illegible]
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1	RES.	NHH
	TECH S.	
	MGMT. S.	
LEAD RESP.		1

REGION X

Office of Community Planning
and Management

RECEIVED
Bureau of Land Management
State Director
DEC 2 - 1971
Cheyenne, Wyoming

IN REPLY REFER TO:

10M - MS 307

State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

Your October 26, 1971 letter to Mr. Orlebeke submitting your draft environmental statement has been sent to us for comment.

The proposed project involves four separate parts consisting of a coal-fired power plant, three 345 KV transmission lines, water pipeline and surge pond and strip mine for coal.

In general we feel that you have adequately covered the environmental impacts in our areas of concern. We would like to see in your final statement a better definition of the kind of work force that would be involved, temporary and permanent, and what plans are being made to provide housing, schooling, transportation and the necessary public services. Are land use plans being prepared by communities that would be effected to lessen possible adverse impacts? The statement indicates that the University of Wyoming will conduct an archeological survey. Are any plans being developed on what action will be taken as a result of the survey?

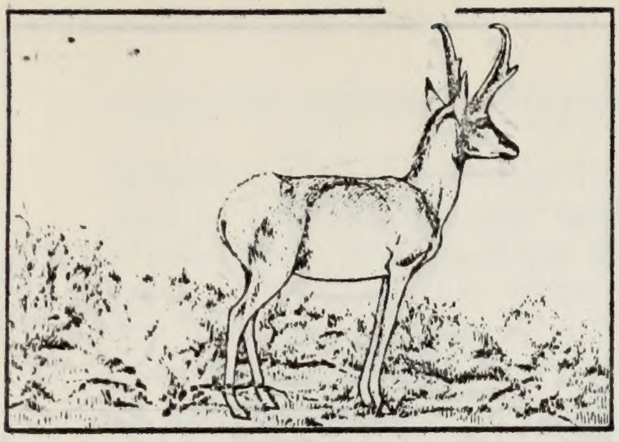
With exception of the above points we do not have any reservations regarding the project. We have contacted our Regional Office in Denver who also has reviewed your statement. We believe our comments are not inconsistent with theirs.

We thank you for the opportunity to comment on your statement.

Sincerely,

John R. Merrill

John R. Merrill
Assistant Regional Administrator for
Community Planning and Management



Sierra Club NORTHERN GREAT PLAINS OFFICE
Post Office Box 721, Dubois, Wyoming 82513

12/3

Routing		Initial & Date
1	SD	
2	ASD	12/3
3	PCS	
	OPA	
4	RES.	
	TECH S.	
	MGMT. S.	

LEAD RESP. 3

December 1, 1971

Mr. Daniel P. Baker
State Director
Bureau of Land Management
Post Office Box 1828
Cheyenne, Wyoming 82001

Dear Dan:

Enclosed is a statement from the Sierra Club and also the John Muir Institute on the Second Draft of the Bridger plant. The two statements should be considered as one unit.

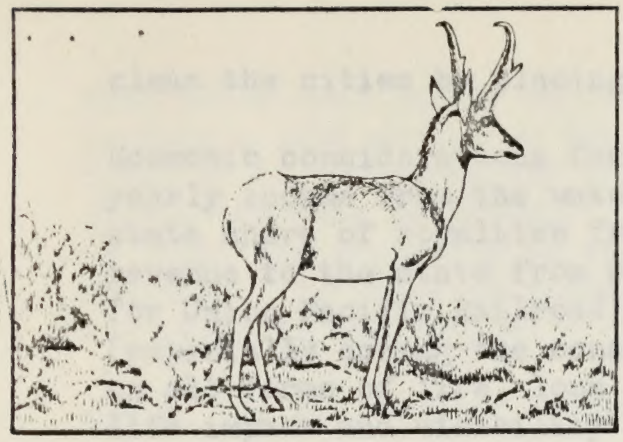
My own statement supercedes my letter of August 30, 1971, on the First Draft. I have commented in full on the project which I did not in the previous letter. Relevant parts of the earlier letter have been repeated here so that only one letter, that of December 1, 1971, need appear in the final draft.

Please add the Sierra Club and John Muir Institute to the list of groups commenting on the statement in the final statement.

Sincerely,

Laney

Miss Laney Hicks
Regional Representative



Sierra Club NORTHERN GREAT PLAINS OFFICE

Post Office Box 721, Dubois, Wyoming 82513

December 1, 1971

Mr. Daniel P. Baker
State Director
Bureau of Land Management
Post Office Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

A copy of the "Second Draft Environmental Impact Statement for the Jim Bridger Thermal-Electric Generation Project" was forwarded to me by your office in late October for comments.

As a general reaction, the Draft seems low-key and exhibits in most cases a verbal concern for land uses. Your staff should be commended for their efforts in putting this statement together, for as I consider the factors involved, it must have been a difficult task to do this study as the plant is already being built and this limits the real opportunity for a complete weighing of alternatives.

Attached to this statement is that of Dr. Michael Williams of the John Muir Institute covering air quality and emission control. His comments are supported by the Sierra Club.

My remarks are necessarily limited by the same circumstances which limited your staff...in areas where a decision has already been made, such as plant location, I can only point at factors which may have been overlooked. Other suggestions may be included or corrected before the final draft is printed.

1. Alternatives to the Proposal (pages 7-18)
At this point in time this section appears to be only a forum to justify the project. Is there a power shortage or is it a matter of making more power available which can then be sold? The utilities have decided this plant is necessary in their own frame of reference and economic expansion goals.

Economic considerations for the company, we may assume, were dominant in the decision to build a power plant and on plant location, but PP&L has also noted in addition that there is less human habitation to be damaged in a remote area by air pollution and less people who can object to this impact. This type of reasoning should be eliminated for it extends the problems of conjested areas to less disturbed locations which still enjoy healthy and beautiful environments. The problem is to clean up the industries, not

clean the cities by placing dirty plants in remote areas.

Economic considerations for the state are less clear. What will be the yearly income from the water service contract, taxes on the plant, and the state share of royalties from coal mined on the public sections? (Yearly revenue to the state from coal might be $250,000, and 3 times that or more for Union Pacific Railroad) What are the costs of increased services (especially during the construction period), damage from air pollution on all forms of life, loss in land productivity in the mined area, wildlife impact and visibility degradation? The matrix system does not supply this information. It attempts to measure the degree of impact but it cannot go beyond that point and is so recognized in the explanation of its use.

2. Unique Communities - Rare species (page 25)
Using the approach that there are no unique plants and animals is misleading and assists in discounting impact. All areas are unique because they are different. A full summary of the interrelationships, biologic and geologic (including selenium bearing formations) of the local ecosystem would serve to identify its stability or lack of it and just where changes would occur. Perhaps Dr. May could supply this for the final statement and include photographs. This type of report is of vital interest to conservationists prior to mining.

3. Economic and Cultural Patterns, Future Trends (pages 27-29)
Why is there no description of what the "existing trends" and "future trends" are being directed toward? The mining for trona, coal and the extraction of oil and gas provide a trend of increased income to the state, but the major land uses are for agriculture, tourism, recreation and wildlife. An increase in mineral activity and power production will change existing land use patterns extensively and will change the cultural patterns of these groups! The Bridger plant is only one of the many power plants planned for Wyoming and cannot be considered in isolation.

I believe that the projections for population growth and income growth as given in the Green River Report #3, of the Wyoming Water Planning Program are on the basis that certain water facilities would be built. More than one source should be quoted here to give a broader picture of alternatives which might develop.

4. Soil Erosion and Deposition Page 53)
There are two questions I feel need answering: a) is all the top soil to be stored separately or just the part for the University study, and b) some estimate should be made of the time period which will be allowed under Federal and State rehabilitation requirements to "minimize erosion impact." The three to eight year lag in reclamation (500 to 1,000 acres) suggested on page 67 seemes unreasonable. What factors can justify this delay? The Sierra Club opposes strip mining for coal and we consider it unfortunate that PP&L has made extensive commitments to this mining method.

5. Scenic Views (page 55)
There are two assumptions which underlie data in this section; the first is that acceptable reclamation is possible and the second that because only a few people may see the mining it will have slight impact on the scenery. We do not view strip mining in remote areas differently than in populated areas. It is a destructive method of extraction and a single use which destroys other values. The area will be completely altered by mining and any reclamation will be difficult if not impossible. Land disturbance could be extended beyond the 5,000 acres for the Bridger mine for

PP&L holds coal leases on 8,400+ acres of public land in this area and perhaps a like amount on the alternate private sections. This makes a total of 16,000 acres and perhaps enough coal to supply two more power plants the size of Bridger. Why is only part of the picture given? To limit the reporting to the life of the plant in this instance is incomplete. In other sections suggestions are made on developments which may occur in the future.

Again, the Sierra Club opposes any expansion of strip mining.

6. Revegetation of Spoil Piles and Other Disturbed Areas (page 66)

I am puzzled on the source of optimism expressed by PP&L and the BLM that reclamation is possible. The Kemmerer coal studies tested various species but did not indicate any special degree of success for native plants under testing conditions or long term success and value of introduced vegetation. No reclamation plan has begun there and to speculate that it would be successful for the short or long term objectives is to suggest results in Wyoming's dry desert climate and marginal soils which have not been achieved in more fertile areas with greater rainfall.

Reclamation studies in other areas have turned out to be small demonstration areas designed to keep the image of the company in a good light and to stall changes toward different mining technology.

Strip mining destroys the natural coherence and stability of the land whether it be a desert, forest or farm. And reclamation programs cannot replace the balance which developed during the 200 million years of soil development - they only aim at controlling the damaging side effects to man. The utilities should consider research investment for new underground mining methods instead of stopgap reclamation efforts.

7. Short-term Use vs. Long-term Productivity (pages 69-70)

How is the conclusion reached that with the exception of CO_2, impact from the project and associated facilities will continue only a "few years beyond the life of the power plant?" There could be long term impact in Wyoming from 130 thousand tons of particulates; 3 million tons of SO_2 and 2 million tons of NO_2 over the 35 year life of the plant. Changes in land use patterns and attempts at land restoration could continue for hundreds of years.

* * * * * * * * * * *

GENERAL COMMENTS

A. Trona plant emissions

a. PP&L's desire not to locate power lines below the Stauffer trona plant because of the corrosive effect on equipment from their emissions is significant. The utility claims little knowledge on the distribution and effect of their own pollution in the environment but in the case where their own equipment was involved - they were quick to see the damaging effects. But the public is being asked not to jump while the effects of utility pollution are measured on vegetation and health. By the time this can be quantified, fifteen more power plants could be built and we can expect all the problems of an industrial center.

b. On the other side, the BLM has told me that they have "no factual evidence of offsite vegetative damage" by trona plant emissions. Is there any reason to believe that plants corrode less easily than utility equipment? My own personal investigation suggests otherwise.

B. Guarantees on pollution control equipment

It seems that a final decision has not been made on the pollution control equipment. Will there be guarantees on the efficiency of the controlling installations? In the past, no such assurances were made and equipment did not perform as promised. This caused greater costs to the public from pollution damage and lost credibility for the utilities. But it also had a mutual benefit for the utilities and equipment manufacturers ...the company could pay less for equipment and the manufacturers didn't have to stand behind the product. We hope this pattern will not be repeated.

C. Matrix rating for Air Pollution

Giving a high rating in the matrix for the impact of air pollution is a fair estimate in our opinion. It should be recognized that regardless of the amount of environmental publicity by PP&L, they are only designing control equipment to meet the required standards and not for limiting the emissions to the lowest possible level. (see appendix to Dr. Williams statement.)

If we are expecting the utilities to spend more in the future to control pollution as they should, we can also expect a double increase in electricity cost. The oil conglomerates control the coal supply and will make a cleaning on profits selling it to the utilities. Will their plans include environmental quality and human health as well as oil and utility profits?

While some of my remarks might be considered as digressions, they will be increasingly a major part of Wyoming's environmental problems in the very near future. They should be recognized now so we don't have to clean up a spoiled environment later.

We appreciate this chance to comment and would like the opportunity to comment on later drafts.

Laney Hicks

Miss Laney Hicks
Regional Representative

MICHAEL D. WILLIAMS
Research Coordinator

JOHN MUIR INSTITUTE
FOR ENVIRONMENTAL STUDIES, Inc.

INITIAL COMMENTS ON THE IMPACT STATEMENT FOR THE JIM BRIDGER GENERATION PROJECT

The impact statement appears to be seriously lacking in many respects. It does not discuss the impact of trace contaminants such as mercury or thorium, although it mentions that requisite data is being obtained. It does not describe in detail the provisions which will be made to prevent air quality problems associated with wind erosion of collected flyash. At Four Corners it appears that this problem rivals that of the stack emissions.

The statement mentions the effect of sulfur oxides on visibility, but it does not discuss the implications of the conversion of sulfur oxides to fine particulates. Fine particulates are expected to result from the conversion of sulfur oxides to sulfates and nitrogen oxides to nitrates. A conservative estimate (Seymour Calvert, University of California at Riverside) gives 11% of the sulfur oxides converting to particulates in a two hour period for a power plant in the Mohave Desert of California. At Jim Bridger such a conversion would produce over 50 tons of fine particulates. These would be expected to have significant impact on visibility.

There are no descriptions of ash content either as to composition or size distribution. Neither is there any description of important coal characteristics such as the nitrogen content. Remarks are made about pyritic sulfur but no analysis for iron is presented. Usually 95% of the sulfur is expected to be released to the atmosphere.

A problem worthy of study is that of sulfate deposition. If only 10% of the sulfur dioxide is converted to sulfates and deposited within 15 miles of the plant in a 90 degree sector, the deposition will exceed the estimated rate of removal by plant uptake or leaching by a factor of six. This suggests that long term change in soil pH could occur. Such changes in soil pH have been observed near smelters. These changes could have dramatic effects on wildlife.

I also have other concerns which are not related to the adequacy of the data but instead to the way it is presented. The data computed by the Bureau of Reclamation is not compared with the standards nor are its other implications developed. For example, coning dispersion is frequently associated with neutral stability which can persist for more than a day. If the sulfur dioxide concentrations of Table 1 are extrapolated to a 24 hour average, they would imply 0.15 ppm, in excess of the standards. Further, the

maximum hourly concentrations of .33ppm would imply 24 hour concentrations of .08 or more very near the standards. The calculated NO_x concentrations are well above the Wyoming standard in most cases. These calculations are based on techniques for large power plants and are well accepted. My own calculations suggest that they may be slightly low. The calculations by Dr. Faith are an enigma to me, but perhaps they can be understood in light of his usual employers. In the September 15, 1971 material he suggests that no commercially proven method of sulfur dioxide removal is available. The participants in the Navajo project are planning to use such equipment at Navajo, which will be a larger plant burning comparable coal. Kansas Power and Light is currently using such equipment. The remarks about NO_x control should be viewed in a similar vein; control of excess air can significantly reduce NO_x formation. This technique has been applied to oil and gas-fired plants and pilot scale coal-fired plants. Studies are now under way on full-sized units.

The high stack approach has been recently discredited. There are meteorological conditions which make high stacks relatively ineffective for stacks taller than 200 feet.

Dr. Faith's remarks on NO_x levels are baffling (page 6). As I understand it, the Wyoming standard is expressed in ppm of NO_x; if this is true the fraction of the total which is NO_2 is irrelevant as far as the standard is concerned. If, however, the measurement gives the total weight of oxides of nitrogen which is then assumed to be nitrogen dioxide when the concentration is expressed in ppm, the difference would still not be great. Using Dr. Faith's number of 30% the factor would be .8. Thus .24 would become .19, still well over the standard. Further, based on New Mexico's experience, 30% is too low, and, of course, in the long term almost all of the NO will convert to NO_2.

Another point which is unconvincing relates to the frequency of fumigation or inversion break-up conditions. In the southwest these conditions are not infrequent and they produce high concentrations for as long as an hour. In the meteorology section, the suggestion that a 12% frequency of slightly unstable conditions precludes frequent fumigations is not well-founded. To illustrate, if slightly unstable conditions occurred everyday of the year with a duration of three hours, the frequency would be 12.5%. This implies that a fumigation condition could exist everyday of the year. More realistically, many of the summer days could produce fumigations when the radiation inversion burns off in the morning. The comment that the plume would penetrate the inversion except in rare and unusual circumstances is also of doubtful validity. With winds of 6 mph or more the plume could not penetrate an inversion layer of 1830 feet in thickness. The report tells us that 3% of the time inversions of 1600 feet or more are present. This could mean a maximum hourly concentrations of .32ppm would imply 24 hour concentrations of .08 or more very near the standards. The calculated NO_2 concentrations are well above the Wyoming standard in most cases. These calculations are based on techniques for large power plants and are well accepted. My own calculations suggest that they may be slightly low. The calculations by Dr. Tatin are an enigma to me, but perhaps they can be understood in light of his usual employers. In the September 15, 1971 material he suggests that no commercially proven method of sulfur dioxide removal is available. The participants in the Navajo project are planning to use such equipment at Navajo, which will be a larger plant burning comparable coal. Kansas Power and Light is currently using such equipment. The remarks about NO_x control should be viewed in a similar vein; control of excess air can significantly reduce NO_x formation. This technique has been applied to oil and gas-fired plants and pilot scale coal-fired plants. Studies are now under way on full-sized units.

The high stack approach has been recently discredited. There are meteorological conditions which make high stacks relatively ineffective for stacks taller than 200 feet.

Dr. Tatin's remarks on NO_2 levels are baffling (page 9). As I understand it, the Wyoming standard is expressed in ppm of NO_2. If this is true the fraction of the total which is NO_2 is irrelevant so far as the standard is concerned. If, however, the measurement gives the total weight of oxides of nitrogen which is then assumed to be nitrogen dioxide when the concentration is expressed in ppm, the difference would still not be great. Using Dr. Tatin's number of 10% the factor would be .8. Thus .12 which becomes .10 still well over the standard. Further, based on New Mexico's experience, 10% is too low. And, of course, in the long term almost all of the NO will convert to NO_2.

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When one is trying to predict the worst possible situation, extrapolations based on only 40 days are somewhat questionable. In addition, there was no discussion of mixing depths associated with limited mixing or trapping conditions. It should also be observed that the expected concentration of sulfur dioxide and nitrogen dioxide are in the range (0.05 to .25 ppm for 3 or 4 hours) which in laboratory experiments have produced damage to vegetation.

The computed maximum NO_x emissions are doubtful. The Navajo plant with similar equipment expects an average of 550 ppm NO_x. Other plants have lower predicted averages, while existing plants have ranged from a low of 300 ppm to about 600 ppm or higher with similar equipment. 500 ppm might be appropriate on an average, however, the maximum emissions could be considerably higher depending on the operating conditions.

I believe that the excuse that emissions from the Trona Plant might damage the power lines and insulators is not valid. If the emissions are capable of damaging these materials, they are also capable of damaging others. This would imply that the Stauffer plant is polluting in the legal sense of the word. The appropriate action is to use Wyoming's laws to control the pollution. I am sure the conservationists would welcome the participation of the utilities in this matter.

The impact of the transmission lines on defacto wilderness should be delineated. The report mentions areas having semi-wilderness qualities, but it is not stated whether these areas might eventually qualify as wilderness were the powerline not constructed. The Parker Case suggests that potential wilderness areas must be studied for wilderness classification before management decisions can be made which would preclude eventual wilderness designation.

One last comment - in general I like the way the impact statement was constructed. I have mentioned some serious deficiencies which I hope will be remedied before the final draft is published. I would appreciate the opportunity to comment on later drafts.

Michael Williams
John Muir Institute

Emissions from the Jim Bridger Plant

	presently planned controls tons/day	moderate controls tons/day	good controls tons/day	Los Angeles regulations tons/day
PARTICULATES	12.9	4.3	1.9	.36
SULFUR OXIDES	284.	28.4	5.7	6.
NITROGEN OXIDES	149.	112.	62.	7.

For particulates: moderate controls include baghouses such as are planned for Four Corners. good controls are 99.9% effective baghouses.

For sulfur oxides: moderate controls are 90% effective scrubbers. good controls are 98% effective scrubbers. Both have been used in power plants in England before World War II.

For oxides of nitrogen: moderate controls are alkali scrubbers like those at Lawrence, Kansas which remove 25 to 30%. good controls use lower excess air and alkali scrubbing. These controls have been used on gas and oil fired plants and small scale coal fired plants.

Implications of Emissions of SO_x and NO_x

control level	planned	moderate	good
3 hour average SOx	.26ppm	.026ppm	.005ppm
3 hour average NOx	.20ppm	.15ppm	.083ppm
3 hour average NO_2 *	.08ppm	.06ppm	.033ppm

Plant damage has been observed at concentrations of .05 to .25 ppm of SO_2 and NO_2 together.

* Limited measurements at Four Corners give peak NO_2 concentrations of approximately 40% of the peak NOx concentrations.

Plume Opacity

control level	light transmitted through plume at 25 miles (downwind)	light transmitted through plume at 50 miles (downwind)
planned	1.1%	0.38%
moderate	52%	50%
good	82%	84%

These plume opacities are for a person looking through the plume at plume level toward a distant object. Looking up or downwind into the plume will decrease the visibility to a greater extent. For the average observer at least 5% transmission is needed to see an object beyond the plume. Thus with present controls the plume would be opaque. With moderate controls the situation is much better while with good controls it is fairly good.

These calculations assume dispersion given by the HEW workbook by Bruce Turner with neutral stability and relatively high wind speeds - 6 meters per second (13.4 miles per hour). They also assume conversion of sulfur oxides to sulfates at the rate of 6% per hour (these rates are considered appropriate for conditions expected in the Mojave Desert during the daytime.) The particulate absorption and scattering is based on the size distribution released from a 99% precipitator with scattering and absorption assumed equal. Because of the uncertainty as to conversion rates, no conversion of NOx to nitrates was assumed.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Idaho State Office
Room 334, Federal Building
550 West Fort Street
Boise, Idaho 83702

IN REPLY REFER TO:

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Routing 12/6 & Units
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MGMT. S.

LEAD RESP. 1

December 3, 1971

Memorandum

To: State Director, Wyoming

From: State Director, Idaho

Subject: Comments on Draft Environmental Impact Statement - Jim Bridger Project

Attached for your review are comments on the second draft from the Idaho Environmental Council.

We will respond to point #2 in the comments.

Wm L Mathews

cc: Director (220)

Idaho Environmental Council

P. O. Box 3371 - University Station
Moscow, Idaho 83843

U S Department of the Interior
NOV 23 1971
Bureau of Land Management
Idaho State Office
Boise Idaho

Nov. 21, 1971

William L. Mathews, Idaho Director
Bureau of Land Management
334 Federal Bldg.
550 West Fort St.
Boise, Idaho 83702

Comments on Second Draft of BLM
102 Statement for Bridger Project

Dear Mr. Mathew;

Thank you for sending a copy of the second draft of the BLM Environmental Impact Statement for the Jim Bridger Project. In it, I believe the following additions represent an improvement over the first draft:

a. Appendix C - "Preliminary Analysis of Meteorological Conditions at the Jim Bridger Plant Site" (An independent analysis and predictive model prepared by the Bureau of Reclamation working with the TVA), and
   Appendix D - "Ground Level Concentrations for Sulfur Dioxide, Particulates, and Nitrogen Oxides" (A preliminary letter-type report from the Owners' Consultant)

b. A discussion of the proposal to dispose of chemical-laden "blowdown" water by burying it in the strip mine, and of the lack of knowledge regarding the possible effects of this action. (Page 40)

c. Comments on "Short-Term Use vs. Long-Term Productivity". (Page 69)

My letter of October 3rd, commenting on the first draft 102 statement applies still to the second draft, except that paragraph 3 under "Air Pollution", page 2, is no longer relevant, due to the addition of Appendices C and D in the second draft. The questions raised in the earlier letter still stand.

Please consider the following points and requests:

1. Public Meetings

The section in the 102 statement on "Consultation and Coordination" stands as a sorry record of the feeble attempts to involve and inform the public. It is my impression that none of the meetings held relative to the Bridger Project were widely publicized, and that no citizen conservationists were even invited. Instead, only government agencies, and local and private entities favoring such development, were represented.

Even at this late date, the situation must be remedied as best possible. Public meetings should be held as soon as possible to inform the western Wyoming and eastern Idaho public as to the environmental implications of this rather significant development. I would suggest that you hold public meetings this winter, in the evenings or weekends, in the larger towns near the project and the planned transmission line. For example, I suggest Rock Springs, Green River, Kemmerer, Jackson or Idaho Falls, Pocatello, Montpelier, and Soda Springs. In the Idaho meetings, somewhat more emphasis should probably be given the transmission lines. BLM might also wish to hold some meetings in eastern Wyoming, since the people there will probably be getting more of the air pollution than those of us west of the project.

2. Description of Land along Transmission Line

I would like to have a more detailed description of the land along the transmission line route, as to ownership, likely future use, and any special values, such as for wildlife, recreation, etc.

3. Air Pollution

The amounts of the various air pollutants produced per day are revised in the second draft, but are about the same as in the first draft. If the dispersion model referenced in Appendices D and C is accurate, the ground level concentrations of SO_2, NO_x, and Particulates should meet air quality standards as set by the U. S. Environmental Protection Agency. Of course, the individual states have until 1975 to comply with EPA standards, and may set more stringent standards if they wish.

Assuming 99.33% efficiency of the electrostatic precipitators, the dispersion model indicates that the particulate emission predicted will be far below the limit set by the EPA regulations. To your knowledge, does the public have any guarantee that the power companies will actually install precipitators with this efficiency, and keep them operating at this efficiency? It may be cheaper for them to pollute up to the limit of the particulate standard.

We do not want another "Four Corners" situation in the Northern Rocky Mountain Region. I do not know if the Four Corners power plant is violating air quality standards or not, but in either case, the implications are frightening; if it is, the law is not being enforced; if it isn't, the law is inadequate, for the visible aspect~~s~~ alone of the air pollution there is atrocious.

4. BLM Coal Leasing

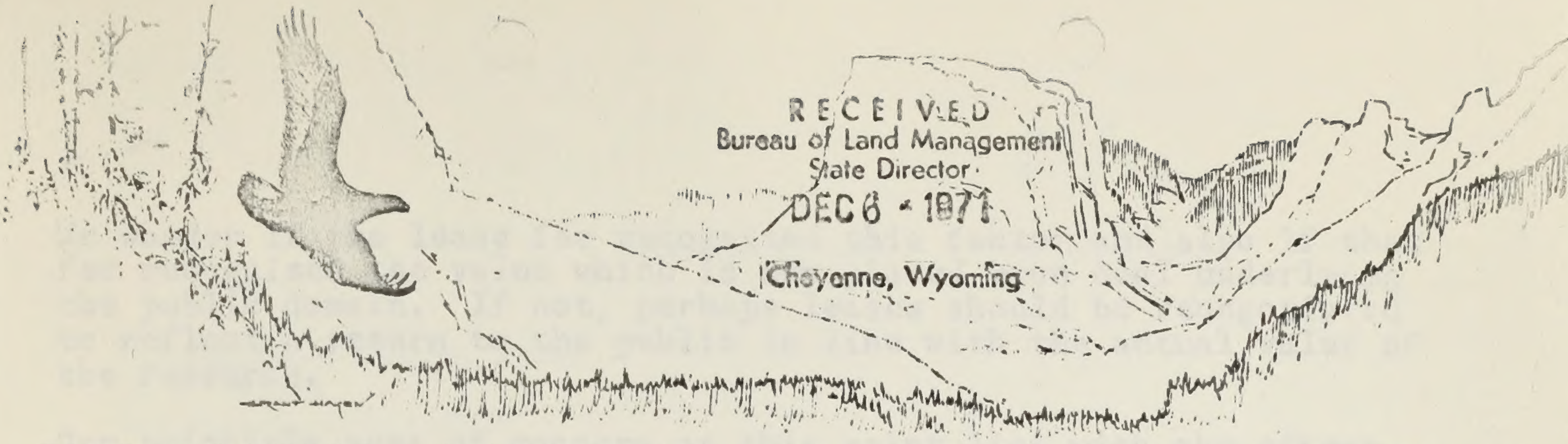
According to High Country News, Nov. 12, 1971, the BLM has not filed one single Environmental Impact statement on coal leases on BLM land, even though this has tremendous environmental implications for most of the western United States.

5. Include all Letters in Final 102 Statement

I don't know if you plan to do so or not, but I would strongly suggest that you include all letters in the final 102 statement which you receive commenting on the draft statements, and not merely an index of those letters. They should be available in the final statement for public scrutiny, as well as for CEQ's use. An example of failure to do this is seen in the BRec's 102 statement on the Lower Teton Project; according to an index, there were about 100 letters of comment, but only a few are included in the final 102 statement, and interested members of the public cannot see the bulk of those letters.

I would appreciate a response from you soon on items 1, 2, and 3 above. Thank you.

Sincerely,
Gerald A. Jayne
Gerald A. Jayne
President, IEC
1568 Lola St.
Idaho Falls, Idaho 83401



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State Director
DEC 6 - 1971
Cheyenne, Wyoming

WYOMING OUTDOOR COORDINATING COUNCIL
P. O. BOX K   LANDER, WYOMING 82520

Routing 12/6		Initial & Date
1	SD	
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	MGMT. S.	

LEAD RESP. 3

December 1, 1971

Mr. Daniel P. Baker
U. S. Post Office Bldg.
2120 Capital Ave.
Cheyenne, Wyoming 82001

Dear Dan:

Thanks for the opportunity to comment on your 102 statement for the Jim Bridger Power Plant.

It seems unfortunate to be in the position of commenting on a project which is already under construction. One of the values of an impact statement would seem to us to be to help weigh the merits of a proposed development against the environmental advantages of no development. The leasing of the land for coal development would not seem to us to have precluded the withholding of authorization for plant construction, with its attendant power and pipeline corridor permits, until completion and review of the impact statement.

The significance of this development on the economic, sociological, and environmental future of the region seems to justify a greater degree of public involvement prior to authorization. We do recognize the complexity of having the plant siting on private lands and the checkerboard pattern of land ownership.

Given the situation of construction in progress, it seems tardy to suggest that comprehensive land planning technique such as employed in the Red Desert Study might have yielded substantial dividends. Citizen groups, as well as county and municipal government might well have participated.

In reference to the area to be strip mined, it is noted that the land surface has a low value in production of forage or other economic benefits. We believe it necessary to recognize that ever-increasing encroachment on open space and undeveloped natural areas is creating an unanticipated premium for those areas remaining.

We wonder if the lease fee recognized this factor and also if that fee recognized the value which is now placed upon coal underlying the public domain. If not, perhaps leases should be renegotiated to reflect a return to the public in line with the actual value of the resource.

Our principle area of concern at this point lies with the effect on ambient air conditions. Existing sources at the trona plants and the Naughton Plant presently create a very undesireable situation during times of low dispersal or temperature inversion. Addition of some 150 tons per day of sulphur dioxide particularly at times of high relative humidity could compound and further degrade the existing situation. It remains to be seen whether this will constitute a violation of the forthcoming EPA regulations. That it is another step in the degradation of Wyoming's formerly high quality air, there can be no question.

In conclusion, we would commend the Bureau of Land Management for the very creditable effort involved in this statement. We would urge that in the future, impact statements precede leasing of coal lands and commitments for construction and operation of steam electric plants. Sophisticated studies as to total impact of multiple coal development facilities on Western landscapes and open spaces need to be undertaken before the environmental impact of individual plants can be accurately assessed.

Sincerely,

Keith

Keith V. Becker
Executive Director
Wyoming Outdoor
Coordinating Council

KVB:cc

RECEIVED
Bureau of Land Management
State Dir.
DEC 7 - 1971
Cheyenne, Wyoming

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MGMT. S.
LEAD RESP.

December 2, 1971

The Honorable Gale W. McGee
U. S. Senate
Washington, D.C. 20510

Dear Senator McGee:

Your letter of November 24 to Dr. Oliver K. Scott regarding potential hazards to birds by the transmission lines from the Jim Bridger power plant has been referred to me.

I would agree with the statement on page 57 of the Bureau of Land Management's impact statement that "there is little or no hazard to large birds perching on the towers." This conclusion is based upon the fact that the minimum distance between "hot" wires and any other metal will be 7' 10" whereas the safe spacing for eagles with full wing spread is probably less than seven feet.

The BLM impact statement is, indeed, very vague in presenting the design of the transmission lines. The one illustration, a photograph following page 63, shows a tower of similar design before the insulators or wires were attached! The final draft of the statement certainly should include a drawing of the tower, insulators and conductor wires with actual dimensions shown.

The use of guy wires on the transmission towers could possibly create more of a hazard to birds by accidental impact than is the case with the conventional type of high-voltage tower. However, I do not feel that this is a critical concern when compared to the general esthetic advantages of the proposed streamlined towers.

In general, very-high-voltage transmission lines are less dangerous to birds than are lower voltage, multi-phase distribution lines which have less space between the wires.

Attachment No. 1 is a copy of Pacific Power and Light Company's proposed tower design. On the drawing I have marked in red the arrangement of the insulators, transmission conductors and the lightning shield wires as I understand them. Each of the three conductors will consist of a pair of wires several inches apart for greater heat dissipation. These are termed "bundled conductors", and the dual wire arrangement accounts for the six conductors mentioned by the BLM. Each pair of wires comprising a bundle will be physically joined at regular intervals; they will be of the same current phase and equal potential. Thus a bird touching both wires of a single bundle should be in no danger of electrocution.

Please note that the arrangement of the insulators and conductors shown in the drawing differ from that shown in the photograph copied from PP&L's impact statement (Attachment No. 2). The photograph shows each of the lower conductor bundles supported by a single vertical insulator, while the drawing

indicates that the lower conductors as well as the upper conductor will be supported by V-shaped insulator yokes, probably to reduce sway in high winds. Either arrangement should be acceptable from the standpoint of bird safety.

My comments above are based upon consulation with the following persons, all of whom were most cooperative and concerned about avoidance of any potential hazards:

Ray Mapston
Wildlife Management Specialist, Casper District, Bureau of Land Management
Thomas W. Rodda
Regional Planner, Wyoming State Office, Bureau of Land Management

Bob Miller, and
Royce Harbicht
Engineering Dept., Wyoming Division, Pacific Power and Light Co.

The Bureau of Land Management in general and the Casper District office in particular has shown a genuine and constructive concern over the problem of bird electrocution. Attachments No. 3 & 4 will give you an idea of some of the work that the BLM is doing in this regard.

We would like to convey to you our sincere appreciation for your interest in the protection of birds-of-prey from the many dangers they are facing. I personally am especially appreciative of your concern over electrocution, for I feel that in the long run electrocution may cause more fatalities and require more effort to remedy than will poisoning and shooting.

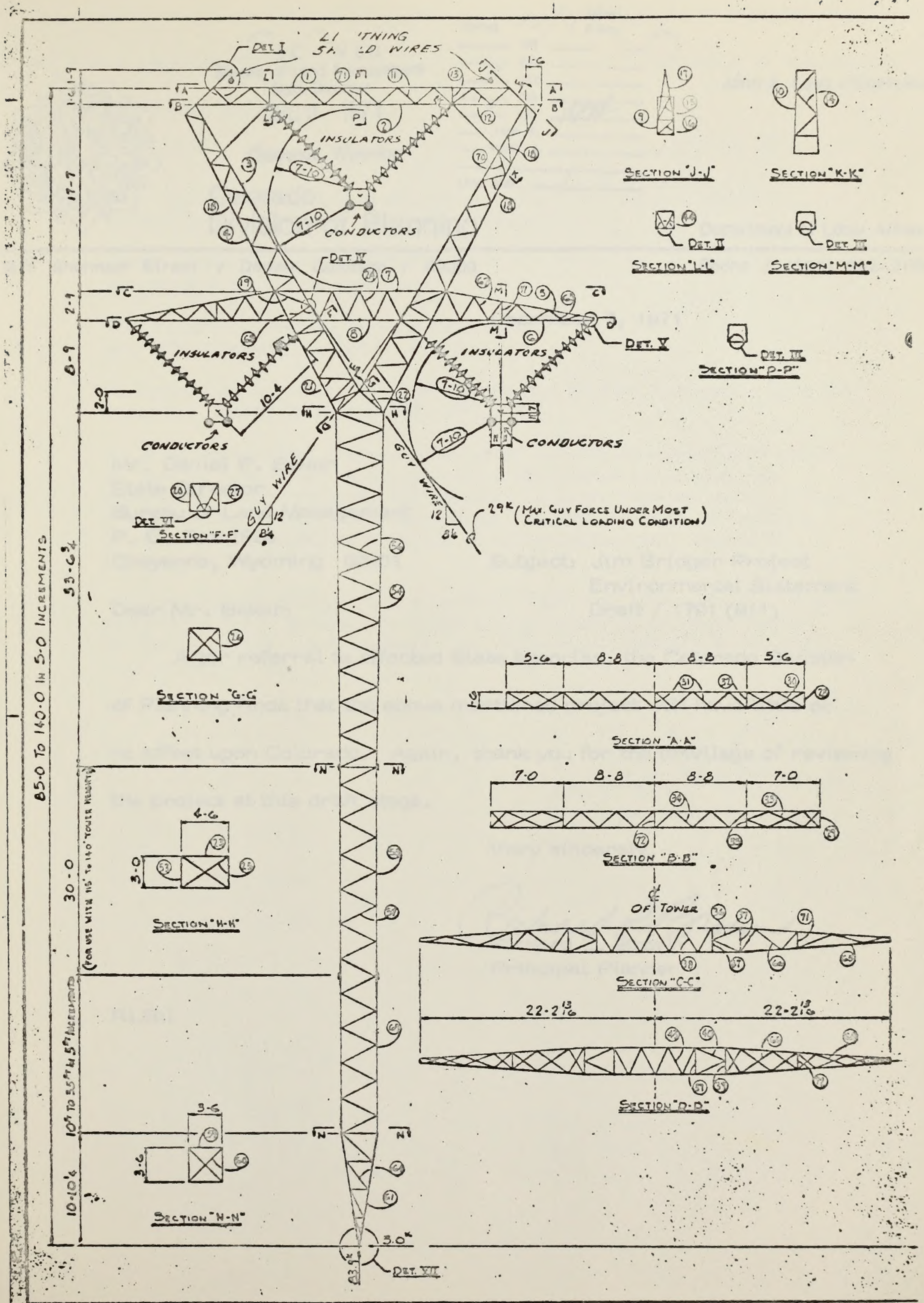
Very truly yours,

MURIE AUDUBON SOCIETY

Bayard D. Rea

Attachments:
✓1. Design drawing of 345 KV aluminum tower for Pacific Power & Light Co.
2. Reproduction of color photograph of actual tower and transmission line from PP&L's environmental impact statement for Jim Bridger plant.
3. Summary of significant finds from meeting of power companies and BLM personnel in Casper on September 29, 1971.
4. BLM information memorandum regarding raptor mortality, dated October 19, 1971.

Copies:
Dr. Oliver K. Scott
Mr. Ray Mapston
✓Mr. Thomas W. Rodda
Mr. Bob Miller



ATTACHMENT No. 1

EC VED
Bureau of Land Management
State Director
DEC 9 - 1971
Cheyenne, Wyoming

Routing 12/9 Initial & Date
SD
3 ASD
PCS
OPA
1 RES.
TECH S.
MGMT. S.
LEAD RESP. 1

John A. Love / Governor

Colorado
Division of Planning

Department of Local Affairs

1575 Sherman Street / Denver, Colorado / 80203
Phone / (303) 892-2178

December 7, 1971

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Subject: Jim Bridger Project
Environmental Statement
Draft / 1791 (911)

Dear Mr. Baker:

After referral to effected State agencies, the Colorado Division of Planning finds that the above mentioned project will have little or no affect upon Colorado. Again, thank you for the privilege of reviewing the project at this draft stage.

Very sincerely,

Richard L. Brown

Richard L. Brown
Principal Planner

RLB:l

Form DOT F 1320.1 (1-67)

UNITED STATES GOVERNMENT

Memorandum

Routing & Date
SD
ASD
3 PCS
OPA
1 RES. MJH
TECH S.
MGMT. S.
LEAD RESP. 1

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

DATE: DEC 02 1971

In reply refer to: TEU-10

SUBJECT: Draft Environmental Impact Statement: Jim Bridger Thermal Electric Generation Project

FROM : Deputy Assistant Secretary for Environment and Urban Systems

TO : State Director, Bureau of Land Management
Box 1828, Cheyenne, Wyoming 82001

We appreciate the opportunity to review the subject statement, enclosed with your letter of October 26, 1971.

It is suggested that discussion be added concerning means which might be used to reduce the visual impact of the transmission lines on population concentrations, and adjacent to major highway rights of way. Possibilities of screening these lines, relocating them, or possibly placing them underground in areas of heavy impact would appear to deserve discussion.

We were pleased to note that a copy has been sent to our Federal Highway Administration. We have forwarded a copy to our Coast Guard Water Resources Office. Any comments from these Departmental offices should come direct to you.

We would appreciate receiving a copy of the final environmental statement.

John Hirten
John E. Hirten
Deputy Assistant Secretary

cc:
Mr. Arensdorf, FHWA
U. S. Coast Guard
Water Resources Office

1791
Jim Bridger

Routing	12/10	Initial & Date
1	SD	
	ASD	
3	PCS	
	OPA	
2	RES.	
	TECH S.	
	MGMT. S.	
LEAD RESP.	2	

WYOMING
EXECUTIVE DEPARTMENT
CHEYENNE

STANLEY K. HATHAWAY
GOVERNOR

December 8, 1971

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Dan:

I wish to take this opportunity to comment on the second draft Environmental Impact Statement prepared by the Bureau of Land Management for the Jim Bridger thermo-electric generation project.

The statement is a thorough and comprehensive discussion of the natural environmental impact aspects of the project, and I regret that a recent newspaper article concerning the draft statement failed to treat it in its full context but chose rather to lift "out of context".

I am pleased to note that in detailing the possible adverse effects of the project on the natural environment, the statement also takes note of the actions that have been taken and the commitments that have been made by the project's sponsors to minimize any adverse impact on the environment. Both Pacific Power and Light Company and the Idaho Power Company have pledged to me their commitment to protect the environment to the fullest capability of their energies and resources. Such commitments include but are not limited to the following:

> All existing state air quality standards and proposed federal air quality standards will be met.
>
> No contaminated water from the plant operations will be released anywhere.
>
> Lands disturbed by construction of the water pipeline, the transmission lines and the coal mining operation itself will be restored to conditions similar to their original conditions.

Additionally, the sponsors have contracted for studies that will assure against depredation or loss of any archaeological, vegetative or wildlife values in the area.

I feel that the final Environmental Impact Statement should give full recognition to these and other commitments of the sponsors for protection of the environment.

Obviously, the economic benefits resulting from this 300 million dollar project are significant, particularly to the State of Wyoming. I speak here of such things as the creation of new jobs and payrolls, additional revenues for state and local governments for the support of schools, hospitals and libraries, and orderly development of natural resources and a new source of much-needed electrical energy which, it should be added, is needed in our national efforts to combat pollution. Such things, I feel, are essential in considering mankind's total environment.

Finally, I should like to give my assurances that the Wyoming Air Resources Council, the Public Service Commission, the Department of Economic Planning and Development and any other state agency concerned will cooperate in every way possible to protect and enhance, where possible, the environment with regard to this and other such projects that may be planned and scheduled for the future.

With my regards and best wishes, I am

Sincerely,

Stan Hathaway

Stan Hathaway

SH:kon

cc: Mr. Don Brunk
Mr. Walter W. Hudson
Mr. Paul Westedt

additionally, the sponsors have contracted for studies that will assure routine inspection of sites of any archaeological, vegetative or wildlife values in the area.

I feel that the final Environmental Impact Statement should give full recognition to these and other commitments of the sponsors for protection of the environment.

Certainly the economic impacts resulting from this 300 million dollar project are significant, particularly to the State of Wyoming. Impacts, however, must include the creation of new jobs and payrolls, additional revenues for state and local governments for the support of schools, hospitals and libraries, the orderly development of mineral resources and a new source of much-needed electrical energy which, it should be added, is needed in our national efforts to combat pollution. Such things, I think, are essential in comprehensive environmental assessment.

Finally, I should like to give my assurances that the Wyoming Air Resources Council, the Public Service Commission, the Department of Economic Planning and Development and any other state agency concerned will cooperate in every way possible to protect and enhance, where possible, the environment with regard to this and other such projects that may be planned and scheduled for the future.

With my regards and best wishes, I am

Sincerely,

Stan Hathaway

SH:mcm

cc: Mr. Don Brown
Mr. Walter W. Hughes
Mr. Paul Jensen

IN REPLY REFER TO:
1791 (911)

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Idaho State Office
Room 334, Federal Building
550 West Fort Street
Boise, Idaho 83702

Routing	12/13	Initial & Date
	SD	
1	ASD	
3	PCS	
	OPA	
2	RES.	NJH
	TECH S.	
	MGMT. S.	
LEAD RESP.	2	

December 9, 1971

Memorandum

To: State Director, Wyoming

From: Associate State Director, Idaho

Subject: Comments on Draft Environmental Impact Statement, Jim Bridger Project

Attached for your review are comments from the USFS - Region 4; Idaho Fish and Game Department; U. S. Bureau of Sport Fisheries and Wildlife; The Environmental Quality Chairman of the League of Women Voters of Idaho; the Director of Recreation and Parks of Burley, Idaho, and two private individuals.

Clair M Whitlock

Attachments

cc: Director (220)

TRUEBLOOD FARMS
BURTT AND MARY TRUEBLOOD
ALFALFA SEED GROWERS
Rt. 1
WILDER, IDAHO 83676

December 1, 1971

Mr. William L. Mathews, State Director
Bureau of Land Management
550 W. Fort Street
Boise, Idaho 83702

Re: 1791 (911)

Dear Mr. Mathews:

I have enjoyed going over the environmental impact study on the Jim Bridger Power Project. You people in the BLM are to be complimented for a very excellent job.

My first reaction, scanning key sections of personal interest has been: What a pity we didn't start doing things like this fifty or more years ago.

I feel I am not qualified to comment on a great many of the subjects covered. I just don't have enough familiarity with the area, nor the technical part of the impact.

There is no doubt in my mind, as each new project, such as this, comes into being, there will be overall negative effects on the environment. For instance, as strict as Federal Standards are, by current thinking, they are not strict enough. Especially in the field of air pollution.

In our business we have problems related to the failure of light in the range necessary for photosynthesis. Light weakens so gradually most people don't notice it, but as each project, such as Jim Bridger comes into production, there will be additional particles to filter our light. Most noticeable positive effect in recent years was the controlling of grass burning in the Willamette Valley. Since that occurred we have had no problem with "Brown Stain" disease in our alfalfa. To maintain our annual yield increases we have a program of foliar feeding designed to compensate for periods of bad light.

In time I feel we will question strongly the hard-sell Idaho Power uses to create artificial demand for more electricity, but unfortunately this is in the future, this nation is not ready to change from an expanding economy to one of equilibrium.

I know it is not within the prerogative of the BLM to question the points I have raised. Maybe later, if we all work hard enough.

Again, my compliments for an exceedingly fine job by very dedicated people.

Very truly yours,

Burtt Trueblood Chairman, Idaho Assoc. of Soil & Water Conservation

Cy

RECEIVED
U S Department of the Interior
NOV 12 1971
Bureau of Land Management
Idaho State Office
Boise

RESOURCES
Date:
Chief
Range
S & W
Soils
Rec/Fr
[illegible]
Lands
Min
Ops
Acn:

Nov. 10, 1971

Mr. William L. Mathews, State Director
Bureau of Land Management
334 Federal Building
550 West Fort Street
Boise, Idaho 83702

Dear Mr. Mathews:

Thank you for the draft copy of the Jim Bridger environmental impact statement. It is impressive. It is exhaustive, and I appreciate the inclusion of the description of alternatives to the proposal, III.

I'm not qualified to comment on the more highly technical data, but the field notes and their evaluation seem to be as objective as is possible.

What would help a layman or a person from another region would be an introductory statement describing the geological history of the area of the plant site (hardly necessary for the transmission Line) including a general description of the soil, together with some general information about the present terrain and the medians and extremes in rainfall, runoff, and wind velocities as an outright introduction -- in other words, the kind of information that appears on page 19 but appearing ahead of the purpose of proposal on page 1. Because the report concerns environmental impact, a sketch of that environment might best introduce the report.

Very truly yours,

Perry Swisher

Perry Swisher
355 S. 11th Av.
Pocatello, ID 83201

COUNCILMEN
REX STANLEY
L.V. MORGAN
JAMES ROPER
JOHN A. CROFT
TED SMITH
SYLVAN BURGI
J. G. ROBERTSON, MAYOR
"CHUCK" SHADDUCK, CITY CLERK

CITY of Burley
OFFICE OF Recreation & Parks

PHONES
CITY CLERK'S OFFICE 678-2224
MAYOR'S OFFICE 678-9311
AREA CODE 208

HUB OF IDAHO'S INDUSTRY
BURLEY, IDAHO 83318

December 2, 1971

Mr. William L. Mathews, State Director
Bureau of Land Management
Boise, Idaho 83702

Dear Mr. Mathews:

I have studied in depth your environmental impact statement concerning the Jim Bridger Thermal-Electric generation project. I also, have attempted to get opinions from others who know the particular areas better than I; we came up with no major objections to the project.

We as recreationists did have one thought, however, that being that since we are not all-knowing and could very easily overlook some facet of the project which could be detrimental to the future interests of recreation; we would suggest that a small percentage of future profits derived from this development be set aside for environmental improvement projects.

Thank you for the opportunity to review the proposed project, we commend your department for it's dedication to wise land use.

Sincerely,

Jack L. Keen

Jack L. Keen
Supt. Rec. & Parks, Burley
Director, IRPS Society

US Department of the Interior
Bureau of Land Management
Idaho State Office
Boise Idaho
DEC 7 1971 AM

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
324 25th Street
Ogden, Utah 84401

2720

NOV 26 1971

William L. Mathews, State Director
Bureau of Land Management
Federal Building, Room 334
550 West Fort Street
Boise, Idaho 83702

Dear Mr. Mathews:

Reference is made to your letter of October 26.

Enclosed is a copy of our brief comments on your second draft of the Jim Bridger Environmental Impact Statement.

As Max Rees of my office discussed with Gerald Magnuson of your office, comments from the Forest Service were requested through channels at the departmental level. Thus, the enclosed statement has been forwarded to our Washington Office.

Overall, we feel the Bureau of Land Management has done a good job in preparation of the impact statement.

Sincerely,

Charles P. [illegible] Jr.
for VERN HAMRE
Regional Forester

Enclosure

RECEIVED
U S Department of the Interior
Bureau of Land Management
State Office
Boise, Idaho
NOV 30 1971
AM

FORWARD SERVICE COMMENTS

on

BUREAU OF LAND MANAGEMENT'S

Second Draft
Environmental Impact Statement

for the

Jim Bridger Thermal-Electric
Generation Project

Prepared by

The Department of Agriculture
U.S. Forest Service
Region 4

II. Description of Proposal

A. General

2. Transmission Lines. The transmission line route as presently proposed, and as narratively described and further identified on the map contained in the report, crosses only Cache National Forest lands.

We suggest the reference to National Forest lands in the last paragraph of page 2 be changed to:

> The proposed right-of-way in Idaho crosses approximately 9.4 miles of Cache National Forest lands.

If any later proposal should involve Caribou National Forest lands, the Forest Service will prepare an environmental analyses of the proposal and shall expect to amend its comments on the Environmental Impact Statement for the overall project accordingly.

VII. Measures Taken to Enhance, Protect, or Mitigate Impacts

A. Transmission Line Locations

7. The comments under "General" above specifically apply. The route selected lies outside, but adjacent to, the National Forest boundary.

9. Suggest the second sentence be deleted and replaced with the following:

> Routes have been carefully evaluated to minimize potential adverse effects on National Forest lands, while coordinating with satisfactory route locations on adjacent lands. The route selected is approximately 1 1/2 miles south of the original proposal. It crosses the Forest boundary on the east side approximately 1/8 mile north of Morgan Canyon. From there it generally follows up the drainage through the head of the South Fork of North Canyon. It would cross the main Bear River range just south of Moonlight Meadow. From there it would span the North Fork of Main Canyon and continue down the Rocky Knoll Ridge. It would pass to the south of Bear Wallow and Thimbleberry Springs and be generally located on the north slope of the ridge to the west Forest boundary.
>
> The area is located in Sections 7, 8, 9, 10, 11, and 14, T. 12 S., R. 42 E; and, Sections 1, 2, 3, and 12, T. 12 S., R. 41 E., Boise Meridian, in Franklin and Bear Lake Counties, Idaho.

Delete photo No. 9, as it depicts the originally proposed route.

10. The northerly proposed route adjacent to the Fort Hall Reservation is shown on the map as not involving Caribou National Forest lands. The comments under "General" above specifically apply.

League of Women Voters of Idaho

RESOURCES
Date: 12-8
✓ Chief
Range
S & W
Soils
Rec/Fr
✓ Wildl
Lands
Min
Clks
Action:

329 South Phillippi
Boise, Idaho 83705
December 6, 1971

Mr. William L. Mathews, State Director
Bureau of Land Management
334 Federal Building
550 West Fort Street
Boise, Idaho 83702

Dear Mr. Mathews,

We were very pleased to be asked to comment on the Jim Bridger Power Project. And although we are not in a position to discuss the more technical aspects of the problem, we do have several observations we would like to have included in the record.

Being an organization dedicated to promoting citizen education and involvement, we deplore the lack of public hearings concerning this project. There should have been informational meetings in such cities as Pocatello and Soda Springs to help inform and to hear from Idaho's citizens. We realize that the legislation requiring impact statements on projects of this sort was passed after the power companies had already begun construction of their plant, but we do feel the public should have been included more positively in the decision making process. All too often we, the people, find out about irrevokable decisions like the building of dams and power plants well after the fact.

Our other area of concern is the plant itself. Although we have been told that, if you have to have a plant, this one is in a good location, we do have doubts about its operation. League members throughout the West have been most concerned by the great power plants in the Four Corners area. As we read of the size of this plant and the area to be strip-mined we can see a real possibility of encountering some of these same problems in the southeastern corner of Wyoming. It is absolutely necessary that this plant be operated with the strictest adherance to procedures for the prevention of air pollution. On more than one occassion we have heard of companies not following through with available abatement techniques because they were expensive or a bother. This must never be allowed to happen at Jim Bridger. We assume that the League of Women Voters of Wyoming has also been asked to comment on this project and would surely second anything they had to say.

In our comments on the new air standards for Idaho we are planning to ask for assurances that anti-degradation policies will be carefully spelled out. Although we have no specific information on wind direction at the Jim Bridger site, we do not want to see pollution drifting in the direction of Idaho. For that matter, we are dedicated to the prevention of the lessening of any air quality if at all possible.

As in many other situations we are frustrated with having to deal with symptoms rather than root causes. The basic problem, of course, lies in the push for more and more energy. Until the attitude of the country first demands less and less pollution instead of more and more energy we are simply fighting a delaying action. Unfortunately, we have no magical answer to this dilemma.

Sincerely,

RECEIVED
U S Department of the Interior
DEC 6 1971 10
Bureau of Land Management
Idaho State Office
Boise Idaho

. ANDRUS, Governor
COMMISSION
G. KALB, Sandpoint
KEETON, Lewiston
ATON, Cascade
EMINGWAY, Sun Valley
ALVORD, Pocatello

JOSEPH C. GREENLEY
Director

IDAHO FISH AND GAME DEPARTMENT

POST OFFICE BOX 25
600 SOUTH WALNUT STREET
BOISE, IDAHO 83707

December 3, 1971

Mr. William L. Mathews, State Director
U. S. Bureau of Land Management
334 Federal Building
550 West Fort Street
Boise, Idaho 83702

Dear Mr. Mathews:

We have reviewed the draft environmental impact statement on the Jim Bridger Power project which was transmitted with your letter of October 27, 1971.

Intensive consideration was given only to those portions of the statement affecting the fish and wildlife resources of Idaho--namely transmission lines. Portions of the proposed transmission line routes will traverse important big game winter range areas in Idaho. General comments in the statement regarding adverse effects of soil erosion and increased access resulting from transmission line construction are applicable to these areas as are comments on silt deposition in streams. Where revegetation of areas disturbed by construction is called for, consideration should be given to replanting with plant species that would be of maximum value to wildlife.

An additional impact of concern to us is the hazard that will be created by transmission lines during the numerous aerial big game census flights that our Department makes over these big game winter range areas. We have experienced serious accidents due to aircraft collisions with power lines in similar circumstances. In order to minimize this hazard, we strongly urge that consideration be given to adequate marking of lines at critical points in these census areas.

Only a superficial review was made of portions of the statement not affecting Idaho. Our general impression of the draft, however, is that it is comprehensive, well written, and well put together.

Sincerely,

IDAHO FISH AND GAME DEPARTMENT

Joseph C. Greenley

Joseph C. Greenley
Director

RI-57

UNITED STATES GOVERNME

Memorandum

BUREAU OF SPORT FISHERIES AND WILDLIFE

TO : State Director, BLM, Boise, Idaho

DATE: December 3, 1971

FROM : Field Supervisor, BSF&W (RBS), Boise

SUBJECT: Jim Bridger Thermo-Electric Generation Project
Draft Environmental Impact Statement - Review and Comments

RECEIVED
DEC 6 1971
US Department of the Interior
Bureau of Land Management
Idaho State Office
Boise Idaho

We compliment you for this fine statement. It is obvious that much thought and effort have gone into its preparation. Since the Jim Bridger Plant is located in Wyoming, our Bureau's formal comments will be submitted from our Region 2 office in Albuquerque, New Mexico. We have a few suggestions concerning the transmission lines that are to be routed into southeastern Idaho.

We note that two alternatives are possible for locating the power lines along the Blackfoot River. The lower route at the base of the hills would probably be the better choice rather than installing the line across the top of the ridges where it would be skylined.

In addition, we suggest that specific fish and wildlife protective measures, developed through consultation with the Idaho Fish and Game Department, Wyoming Game and Fish Commission, and the Bureau of Sport Fisheries and Wildlife be included in any permits for right-of-way. Also, we wonder if it would be advisable for the Bureau of Land Management to require the posting of a performance bond until proof is provided by the companies that all stipulations have been complied with for protection of the environment. We trust that close surveillance will be made by the Bureau of Land Management, to keep abreast of all developments and to insure that all recommendations are followed.

Thank you for the opportunity to review the environmental impact report.

Liven A. Peterson Jr.

Liven A. Peterson, Jr.

cc:
Field Supervisor, River Basin Studies
Room 2225, Federal Bldg.
Salt Lake City, Utah 84111

RECEIVED
DEC 3 1971
US Department of the Interior
Bureau of Land Management
Idaho State Office
Boise Idaho

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Washington, D. C. 20250

DEC 7 1971

RECEIVED
Bureau of Land Management
State Director
DEC 13 1971
Cheyenne, Wyoming

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ASD
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TECH S.
MGMT. S.
LEAD RESP. /

State Director
Bureau of Land Management
P.O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

This is regarding our review of the Jim Bridger Project draft environmental statement which was sent to us on October 26, 1971.

We appreciate having the opportunity to comment on this extensive Thermal-Electric Generation Project. Our comments will be combined and submitted with the Department of Agriculture's. We are, however, sending a copy of this draft environmental statement to Mr. Harold W. Cooper, State Conservationist for Wyoming who is located at the Federal Office Building, P. O. Box 2440, Casper, Wyoming, for his information. If he or his staff have any additional comments, he will submit them to your office.

Sincerely,

Norman A. Berg
Acting
Kenneth E. Grant
Administrator

March 3, 1849

United States Department of the Interior

BUREAU OF OUTDOOR RECREATION
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

Routing 12/14 Initial & Date
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ASD
2 PCS
OPA
1 RES.
TECH S.
MGMT. S.
LEAD RESP. ✓

December 1, 1971

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

Due to an inadvertence on our part, comments from our Mid-Continent and Pacific Northwest regions regarding the Jim Bridger Project, Wyoming, were sent to us rather than directly to you. Enclosed are those review comments. We hope that this error has not caused any delay in your review procedures.

Sincerely yours,

for Jerome F. Anderson
Louis E. Reid, Jr.
Chief, Division of Cooperative Services

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF OUTDOOR RECREATION
PACIFIC NORTHWEST REGION
1000 SECOND AVENUE
SEATTLE, WASHINGTON 98104

IN REPLY REFER TO:
D6419

NOV 22 1971

Memorandum

To: Director
Special attention of: Chief, Division of Cooperative Services

From: Regional Director, Pacific Northwest Region

Subject: Review of Draft Environmental Statement for the Jim Bridger Project, Wyoming-Idaho Power Company and Pacific Power and Light Company

This responds to Mr. Louis Reid's memorandum of November 1, soliciting our views on the subject. We direct our comments primarily toward that aspect of the statement concerning the impact of the project in this Region, i.e. the high voltage transmission in Idaho. We also have general comments on other aspects which concern the overall project itself, including the plant site in Wyoming in the Mid-Continent Region. We assume you will also receive comments from the Mid-Continent Region.

We have the following comments:

1. The Idaho Department of Parks should be included in the consultation and coordination aspects of the project. They should have opportunity to comment on transmission line and substation locations, as well as review the Draft Environmental Statement. Some state parks may be located in the vicinity of the tentative transmission line corridors.

2. The transmission line corridors are generalized. It appears that the proposed rights-of-way avoid areas such as Soda Springs, Blackfoot, and Pocatello where we have Grant-in-Aid projects. Without more detailed location plans, no precise evaluation can be made.

OGS DIRECTOR

3. Some research on the problem of locating high voltage transmission lines, to minimize scenic disruption, has been accomplished. The findings of this research should be utilized when finalizing the location of transmission lines for the Jim Bridger project. We have particular reference to some of the publications of the Bonneville Power Administration and the U. S. Forest Service.

4. The expected impact of snow machine users on big game winter habitat (page 46) could be reduced with proper management and control of winter recreational use on the power line rights-of-way. Access to big game winter habitat areas could be restricted during the winter months to minimize the adverse impact of the project on wildlife.

5. The effect of stack emissions on visibility and aesthetics is of particular concern to us. The discussion in the Draft Statement on this aspect of the project lacks meaning since it relies heavily on an example of a New York City power plant (page 36). This example does not allow us to clearly visualize the potential impact of the project on air quality and viewing of scenery. To say only that visibility would be better than it is in New York City would still allow for its substantial reduction. The recreation-oriented economy of the state is quite dependent on the well publicized scenery, much of which is due to the illusion of close proximity of distant scenes which the viewer experiences because of the exceptional visibility.

Maurice H. Lundy

Maurice H. Lundy
Regional Director

cc:
Director, Mid-Continent Region

March 3, 1849

United States Department of the Interior
BUREAU OF OUTDOOR RECREATION
MID-CONTINENT REGION
BUILDING 41, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY REFER TO:

E35

NOV 24 1971

Memorandum

To: Director, Bureau of Outdoor Recreation
Attention: Chief, Division of Cooperative Services

From: Regional Director, Mid-Continent Region

Subject: Review Comments for Draft Environmental Statement on Jim Bridger Project, Wyoming (Joint Venture of Idaho Power Company and Pacific Light and Power Company)

Enclosed are our comments on the subject statement as requested in your memorandum of November 1, 1971. Please let us know if you or BLM have any questions. We would appreciate the opportunity to provide further clarification if necessary.

The Pacific Northwest Region has also forwarded your office comments on this project. We have coordinated these comments with them and there should not be any conflicts.

Warren J. [illegible]
actg for
Maurice D. Arnold

Enclosure

CC: DIRECTOR

Comments on BLM's "Second Draft, Environmental Impact Statement for the Jim Bridger Thermal-Electric Generation Project" dated September 30, 1971

General Comments

The statement treats some of the important environmental questions relating to this particular project, but it ignores the larger and more important questions. Some of these are:

1. What will be the environmental impact of providing more power in the Northwest? Will it encourage population redistribution within the region and the United States? And if so, what are the ramifications of this redistribution? If it will encourage further growth in population, is this in accordance with the desires of present residents and the land's suitability for use (carrying capacity)? It is becoming increasingly obvious that providing power should be used as a tool to help achieve regional development objectives. It should be made clear as to whether the Jim Bridger Plant will help achieve these goals (economic and environmental) or whether it will meet needs of a population size determined by a simple straight-line projection.

2. If it is determined that the power is needed, then the second question should be addressed to the alternative sources. These include hydroelectric dams, fossil fueled plants, nuclear fueled plants, etc. The statement touches on each of these but dismisses them before any comparison of relative impacts can be made. The depth and detail in many cases needs to be just as great as is the environmental statement for the particular plant being proposed. Until this information is available there is no way of determining the impact of the proposed project as compared to alternatives and hence no way of determining whether or not the proposed project is in accord with environmental policies set forth by the Act (Public Law 91-190).

Since these questions are not answered we do not believe this environmental statement satisfies either the spirit or letter of the law. The statement treats in depth only those questions pertaining specifically to this project, apparently assuming that this is all that is necessary because the plant is already under construction. However, recent court decisions on the Cossatot River project of the Corps of Engineers and the Calvert Cliffs project of the Atomic Energy Commission and others have made it eminently clear that this is not a valid argument. Adequate environmental statements treating all alternatives must be prepared regardless of whether or not a project is under construction.

I do not believe that an adequate environmental impact statement can be prepared for a project of this size without having a resource inventory and analysis completed beforehand. For example, the relative environmental impact of using this particular coal cannot be shown until it is known where all of the coal deposits are within the region, what their relative polluting qualities are, how far they are from water, etc. It is entirely possible that there may be deposits with even less sulfur polluting

qualities and that they may be located much nearer the points of power use necessitating less powerline construction. Questions such as these are vital if we are to understand the degree to which the proposed project meets national environmental policies. A resource inventory of the several state region impacted by the Jim Bridger Plant would be a major undertaking probably costing 3 to 6 million dollars. The inventory would be useful to anyone proposing any kind of development and consequently if we had a choice, it should probably be financed by a broad range of private and governmental interests. However, at this point in time, it is not available and it is the power companies that are proposing a project that will have a major impact on the region. If nothing else can be worked out, they should finance the inventory. It would cost only 1 to 2 percent of the proposed total $300,000,000 investment. Obviously, the companies already have an indication of its importance as they are trying to initiate one (page 58).

Specific Comments

1. One of the more important items that should be treated in more detail is the question of water use. The plant will consume 40 cfs and this is enough water to satisfy the needs of a city of a quarter of a million people. The consumption of this much water in the water-short Colorado Basin should be a matter of considerable concern, especially since the power produced will be used in a water-surplus/basin (Columbia Basin). Serious discussion is being devoted to the possibility of transporting water from the Columbia Basin into the Colorado. This raises serious question as to whether this would be a prudent use of resources.

2. The statement mentions that the salinity concentrations will be increased from 700 parts per million to 701.4 parts per million at Hoover Dam several hundred miles below the point of water withdrawal. Possibly more important and more informative is the increased salinity closer to the point of withdrawal. For example, how much would it be increased during low flow periods of the Green River at various locations below the withdrawal point?

3. The environmental statement addresses some discussion to the impact of the 100 new permanent employees that would be employed at the plant site. This should be treated in more detail. In addition, the impact of temporary employees needs to be discussed. Some questions that need to be addressed are: What impact will there be on the school systems? What provisions are made for trailer courts? What "economic bust" conditions will be created when the temporary employees leave? What urban sprawl would be encouraged?

4. The 42-mile pipeline will be located in its own corridor somewhat paralleling both Interstate 80 and the new powerlines leading away

from the plant. Why not use the Interstate right-of-way or the powerline right-of-way for the pipeline? Locating it in either of these would eliminate one of the three environmental disturbances. From Rock Springs to the vicinity of the plant site, there are or will be three 345 KV lines, the existing 230 KV lines, the 34.5 KV construction line, the 42-mile long pipeline, and Interstate 80. Is it possible that all of these developments could be placed in the existing Interstate right-of-way? Would it be possible to place the lines and pipelines underground or in a ground level conduit with the economies of multiple-use corridors? The question of multiple-use corridors should also be treated for the entire powerline.

5. Is it necessary to split the powerline single corridor into the two proposed going west from Montpelier? On the surface, this seems to be an especially valid question since the line going northwest to the Goshen substation turns south and comes back into the other corridor near the Ft. Hall Indian Reservation.

6. The new powerline corridors are paralleled and crisscrossed in many places with existing Utah Power and Light Company lines. An obvious question that isn't adequately treated in the statement is why can't these existing lines be moved into the new corridors that will be created by the Jim Bridger lines? Since they are relatively minor lines the cost of doing so may not be prohibitive. It would not be necessary to move them concurrent with construction of the Jim Bridger lines. They could be moved in the future as normal maintenance and replacement becomes necessary. This may be an opportunity to reduce environmental impact of existing powerlines with a net improvement attributed to the Jim Bridger Project.

7. In several places the statement refers to minimum pollution standards and reclamation regulations that the company will be expected to meet or work within. The statement should delineate exactly what these requirements and stipulations will be and who will be responsible for enforcement. Also, will the BLM require the power companies to meet standards on private lands as a condition of issuing right-of-way permits?

8. The statement mentions that 500 to 1,000 acres will be disturbed at any one time. This seems to be an exceedingly large acreage, especially since only about 125 acres would be strip mined each year. Is it possible to revegetate and reclaim land on an annual basis to reduce the scarred area?

9. The statement mentions in several places that lower grade coal located below the coal to be mined will be available for future use if needed.

Would this actually be the case if the 150 feet of overburden is replaced each year as the stripping progresses? Wouldn't it be necessary to extract the low-grade deeper coal at the same time in order to make it economically feasible?

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (WS/83)
400 SEVENTH STREET SW.
WASHINGTON, D.C. ~~XXX~~ 20590
PHONE: 202 426-2262

13 DEC 1971

Mr. Ed Hastey
Director, Bureau of Land
Management
U. S. Department of the Interior
Washington, D. C. 20240

Dear Mr. Hastey:

This is in response to your letter of 26 October 1971 addressed to Mr. Herbert F. DeSimone, Assistant Secretary for Environment and Urban Systems, concerning the draft environmental impact statement on the Jim Bridger Project, Wyoming.

The concerned operating administrations of the Department of Transportation have reviewed the draft statement for this project. Noted from the Federal Railroad Administration's review of the draft environmental statement is the following:

> "While we take no exception with the project, we are quite concerned that the map, Exhibit I, does not display the existing present rail lines in the area.
>
> "A quick comparison with the U.S.G.S. maps for this area indicates that the proposed transmission lines will probably cross and perhaps parallel existing rail lines. Past experience has shown that inductive coupling or direct fault could exist between the transmission lines and the communication and signal lines of the railroad.
>
> "We trust that this aspect of the project will be given thorough consideration in the final design stages and an indication given that the railroads have been consulted and have given their concurrence."

The Department of Transportation concurs with the comments of the Federal Railroad Administration and it is requested that the final environmental statement include such an indication and concurrence by the concerned railroad

companies. It would additionally be most helpful if a map of the area showing not only railroad lines but also highways, roads and transmission lines be included with the final statement.

The draft environmental impact statement for the Jim Bridger Project was reviewed with great interest by this Department. While it is recognized that the present impact of the project upon transportation is not great due to the fortuitous proximity of the fuel source (coal), it is also recognized that this fuel source is not limitless in the area. At that point in time, 35 years, when the energy being produced by the plant is probably needed the greatest, the fuel source, according to the statement, should be almost depleted. On a practical basis, it is a known fact that the nation's energy supply falls further and further behind the demands for power. Because of environmental considerations many necessary power plants will not be built or will be delayed in construction. The Jim Bridger Plant may very well necessarily be in use beyond the projected life of the plant and the impact upon transportation will then be considerably higher as fuel for the plant must be transported from outside the area sources. Although this aspect of the project should not be a consideration for the final statement, it should be given some thought for future transportation planning.

The Department of Transportation concurs with the project and recommends implementation at as early a date as possible.

The opportunity for this Department to review and comment on the draft environmental impact statement for the Jim Bridger Project is appreciated.

Sincerely,

W. M. Benkert

W. M. BENKERT
Rear Admiral, U. S. Coast Guard
Chief, Office of Marine Environment
and Systems

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

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December 13, 1971

State Director
Bureau of Land Management
P.O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

We have had the draft environmental statement for the Jim Bridger Thermal Electric Generating Project reviewed in the relevant agencies of the Department of Agriculture, including the Rural Electrification Administration to whom you sent two copies for review separately, and comments from Soil Conservation Service are attached.

The Forest Service of the Department of Agriculture is conducting its review separately from the rest of the Department and will communicate the results thereof directly.

Three copies of the statement are returned herewith.

Sincerely,

T C Byerly

T. C. BYERLY
Coordinator, Environmental
Quality Activities

Attachments

Review of Draft Environmental Statement

Jim Bridger Project - Wyoming

November 16, 1971

Following are the Soil Conservation Service's comments on the second draft environmental impact statement for the Jim Bridger Thermal-Electric Generation Project dated September 30, 1971.

The Statement provides a lot of detail on the effect of the many facets of the Project on the environment of the area. However, the provisions for treating the aspects of construction and development of the project to control to minimize the adverse effects of these measures on the environment is somewhat limited.

The statement on page 22 - "The natural capacity of the vegetation to heal or vegetate disturbed areas is quite good providing the disturbance does not remove top soil." - causes us some concern. The climate and low fertility soils in the area are not condusive to quick vegetation and the restoration of natural cover under natural conditions is extremely slow. The removal of natural vegetation, soil erosion, and soil deposition are recognized under the sections for Transmission Lines, Water Supply System, and Coal Mine Operation and the implication is that the re-establishment of vegetation and the regrowth of natural vegetation will be difficult due to the soils and climate. There needs to be some clarification on these two opposing points.

Erosion by wind is also recognized under the Section D. Coal Mine Operations beginning on page 53. Here again the implication is that this Wind Erosion will be temporary in nature, "federal and state rehabilitation requirements should make the time period of soil vunerability to wind erosion

temporary in nature." No reference is given as to what these requirements are and how their application could make wind erosion "temporary."

The Soil Conservation Service has concern and interest regarding Chapter VII. Measures Taken to Enhance, Protect or Mitigate Impacts. C. Revegetation of Spoil Piles and Other Disturbed Area. We feel that the Soil Conservation Service should be consulted about the soils, climate, range sites and the suitability of various plants that are availabe for revegetation work. Additionally, the SCS Plant Materials Centers at Bridger, Montana and Aberdeen, Idaho, which serve the area concerned, are carrying on plant development work that may have direct application to the area and problems or can be designed to do so.

For the areas of soils disturbance related to the Coal Mine Operation, consideration should be given to temporary measures to control the wind erosion on the strip mine land. This could possibly be mitigated by the use of temporary mechanical measures (such as snow fences) or by the application of synthetic materials on the soils surface. The proposed study on how to revegetate spoil piles is a noble statement. But when technical information is readily available through the SCS for the control of the erosion of these disturbed areas, the delay that would certainly result while the study is b being made is really unnecessary.

We would further suggest that Mr. Harold Cooper, State Conservationist, SCS, Casper, Wyoming could be contacted for assistance in developing specifications for these erosion control measures.

OFFICE OF THE DIRECTOR

March 3, 1849

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D.C. 20240

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December 9, 1971

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

As requested, the draft environmental statement for the Jim Bridger Thermal-Electric Generation Project, Wyoming, has been reviewed by the Bureau of Mines. Within our expertise, we consider it to be a generally thorough evaluation of the environmental impact of the project. We note that an environmental impact matrix was made for several parts of the project, including coal mining.

Although the decision to use coal instead of petroleum has been made, undoubtedly after evaluating many economic factors, the statement should comment on Wyoming's petroleum resources. On page 4, the discussion of the mineral industries should mention the oil- and gasfields in the area. On page 10, section 5, the alternative referring to oil and gas mentions the lack of those fuels in the Pacific Northwest, but it does not comment on the large petroleum resources of Wyoming, the site of the powerplant. These omissions are significant because petroleum is an important resource in Wyoming. Wyoming's proved petroleum reserves at the end of 1970 included about 1 billion barrels of crude oil and 4.2 trillion cubic feet of natural gas. In 1970 the State produced 160.3 million barrels of crude oil (154.9 million barrels in 1969) and 362.8 billion cubic feet of natural gas (303.5 billion cubic feet in 1969). The production in 1970 was valued at $534 million, which comprised about three-fourths of the value of all mineral production in the State. Wyoming also has nine operating petroleum refineries. Considering all these facts, we suggest that the statement mention Wyoming's petroleum resources and include a brief comment explaining why the State's petroleum is not an acceptable alternative fuel for the powerplant.

Evidently a conscientious effort was made in selecting routes that will make the transmission lines as unobtrusive as possible. Presumably the planning for the lines included an evaluation of the location and possible future development of any mineral resources along the route. The statement implies that this was done. A comment referring specifically to mineral resources would clarify the point.

The summary of environmental impacts, part VI, would be more complete if the sections on the generating plant and related facilities and coal mine operation included a brief evaluation of the possible environmental consequences that could result from processing and stockpiling the coal. The principal possible impacts are the contamination of surface and ground water, and the addition of dust to the air during windy periods.

In summary, we feel that the inclusion of the above points into the appropriate sections would complement the generally thorough analysis contained in the statement.

Sincerely yours,

Acting Director

THE ASSISTANT SECRETARY OF COMMERCE
Washington, D.C. 20230

December 15, 1971

Mr. Ed Hastey
U. S. Department of the Interior
Bureau of Land Management
Washington, D. C. 20240

Dear Mr. Hastey:

In response to your letter of October 26, 1971, I am enclosing comments from NOAA on draft environmental impact statement for the Jim Bridger Project. We hope these will be of use in preparing the final environmental impact statements.

Sincerely,

Sidney R Galler

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosure

National Oceanic and Atmospheric Administration
ENVIRONMENTAL RESEARCH LABORATORIES
Silver Spring, Maryland 20910

Comments on

Second Draft Environmental Impact Statement
by the U.S. Department of Interior
for the Jim Bridger Thermal-Electric Generation Project

Prepared by

Air Resources Environmental Laboratory
National Oceanic and Atmospheric Administration
December 1, 1971

Without the availability of the onsite meteorological data taken during the period September 1970 through June 1971, we cannot make an adequate assessment of the environmental impact of the effluent from the 3 proposed units. In addition, we find the analysis made in Appendix C to be inadequately documented. Nowhere in the report is there a detailed terrain map showing elevation contours within a radius of at least 50 km from the site. From other sources, we have determined that the Aspen Mountains, about 30 km towards the southwest, are at an elevation of about 8,000 ft. MSL with one peak at 8,688 ft. MSL. The site elevation is at 6,700 ft. MSL.

With a ground-based inversion over the valley to a depth of 1,500 ft. and flow towards the southwest, the effective stack height of 1,000 ft. (consistent with information in Appendix D) would be eliminated at a distance of 30 km as the plume flowed along the Aspen Mountains. Assuming a likely nighttime condition (Pasquill Type F diffusion and a 3 m/sec wind speed), the estimated 1-hr. ground level SO_2 concentration along the mountains is about 2,000 μ grams/m^3 using an emission rate of 94.5 tons per day. This is a factor of 3 higher than the limiting case in Tables 1 through 4, Appendix C. The latter estimates were carried out only to a distance of 14 km and assumed the maximum emission from only 1 unit.

It is our strong recommendation that the onsite meteorological data collection which was started over a year ago be analyzed and presented in the Final Environmental Impact Statement. We reserve further comments until such information is made available.

United States Department of the Interior

BUREAU OF RECLAMATION
WASHINGTON, D.C. 20240

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IN REPLY REFER TO: 610

DEC 17 1971

State Director
Bureau of Land Management
Post Office Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

As requested by the Bureau of Land Management in its memorandum of October 26, 1971, we have reviewed the draft environmental statement on the Jim Bridger Thermal-Electric Generation Project in Wyoming and Idaho and have the following comments:

1. It would be desirable for Chapter IV, Description of the Environment, to contain additional information on the present and projected level of economic development, employment, and related social or cultural factors on the basis of no project. Also, additional and more comprehensive data on power needs would be helpful.

2. Monitoring and oversight responsibilities for air and water quality when the powerplant becomes operational should be discussed. The report should identify the entity which will be responsible for determining compliance and it should set forth the procedures which will be implemented to assure such compliance.

3. Pages 2, 45, and 59. The project will require transmission lines which will be interconnected with other transmission facilities. In order to give the reader a better perspective as to the relationship of the project's transmission lines with other transmission facilities, we believe it would be desirable to include a map showing existing and/or planned power facilities in the general area of the project. (Related comments in paragraphs No. 8 and 9)

4. Page 4 - This page describes the location of the powerplant. As noted in the preceding comment, a map showing its location in relationship to major cities such as Denver, Cheyenne, and Casper,

and with other existing and planned thermal-electric plants would be desirable. Such a map would aid the reader in determining the interrelationship between the plant and other area facilities. This is particularly pertinent since subsequent discussion on page 35, subparagraph c, indicates that emissions from the plant will probably affect the Denver, Cheyenne, and Casper airsheds. Subparagraph c should be expanded to indicate how significant such emissions may be in the Denver, Cheyenne, and Casper areas.

5. Page 7 - The meaning of the first sentence would be clarified by changing the phrase "has been adjusted" to "has been advanced."

6. Page 8 - The paragraph which discusses the hydroelectric alternative should be expanded to discuss the alternative of combining both a coal-fired thermal-electric plant and hydroelectric power as a source of supply.

7. Page 9 - In the Nuclear Alternative paragraph, it is stated "The reasons that led Pacific Power and Light Company and Idaho Power Company to select the Wyoming coal alternative are found on page 15 of the companies' Environmental Impact Study Report . . ." To avoid dependence on another report that may not be available to the reviewer, this section of the environmental statement should be expanded to indicate the rationale for the choice of the Wyoming development.

8. Pages 14 and 15 - Transmission lines - Reasons for three 345-kv lines rather than two 500-kv lines should be more thoroughly explained. Two 500-kv lines may be adequate for reliability and may be more desirable for future transmission requirements--especially if the plant is expanded beyond the proposed 1500 mw. The future need for possible higher voltage transmission seems to be recognized in the statement, since it is indicated that the 345-kv lines could be upgraded, and that a fourth line, possibly 500-kv, could be required.

9. Page 15 - The statement on this page concerning the permit for lines seems too restrictive. There are extensive coal deposits in Wyoming, and we believe that it is unrealistic at this time to stipulate that future transmission lines should be restricted to the proposed corridor.

10. Page 26 - Paragraph E, last line. We suggest that the words "the concerned reach" be substituted for "it."

and with other existing and planned thermal-electric plants would be discussed. Such a map would aid the reader in determining the interrelationship between the plant and other area facilities. This is particularly pertinent since subsequent discussion on page 25, paragraph 4.1, indicates that emissions from the plant will probably affect the Denver, Cheyenne, and Casper airsheds. Subparagraph c should be expanded to indicate how significant such emissions may be at the Denver, Cheyenne, and Casper areas.

5. Page 7 - The meaning of the first sentence would be clarified by changing the phrase "has been adjusted" to "has been adopted."

6. Page 8 - The paragraph which discusses the hydroelectric alternative should be expanded to discuss the alternative of combining both a relatively small thermal-electric plant and hydroelectric power as a source of supply.

7. Page 9 - In the nuclear alternative paragraph, it is stated "The Colorado Ute, the Pacific Power and Light Company and Idaho Power Company's studies of the existing coal alternative are found on page 13 of the accompanying 'Environmental Impact Study Report . . .'" Directly referencing an outside report that may not be available to the reviewer, this section of the environmental statement should be expanded to include the rationale for the choice of the present development.

8. Pages 14 and 15 - Transmission Lines - Because the three 345-kv lines carrying 1500-mw, these should be more thoroughly explained. The proposed lines may be adequate for reliability and may be more than adequate to handle transmission requirements--especially if the plant is expanded beyond the proposed 1500 mw. The choice made for possible higher voltage transmission needs to be documented in the statement, since it is indicated that the 345-kv lines could be upgraded, and that a fourth line, possibly 500-kv, would be required.

9. Page 17 - The statement on this page concerning the permit and line route is somewhat premature. There are extensive coal deposits in Wyoming, and we believe that it is unrealistic at this time to stipulate that future construction of lines should be restricted to the proposed corridor.

10. Page 20 - Paragraph 4, last line. We suggest that the words "the specified route" be substituted for "it."

11. Pages 28 and 29 - Oil Shale Development - The statement under "Future Trends" that future oil shale and other developments can be easily accommodated in Sweetwater County without materially changing present extensive land-use patterns could be misunderstood. Oil shale development would have substantial environmental impact effects. This statement could be expanded to clarify the meaning.

12. Page 33 - This page includes a reference to Wyoming particulate standards. The discussion should be broadened to include adjacent State standards to give the reader a perspective of what other States require, particularly the power importing States. Also, it is indicated that more demanding Federal New Source Performance Standards will be issued in the fall of 1971. Since the environmental statement carries a September 30 date and may be released sometime in December 1971 or later, the above statement should be verified and updated if possible. The question as to whether the Jim Bridger Plant is considered an "existing" plant under EPA's proposed standards, or whether it is considered a "new source," to which the new EPA standards would be applicable should be answered.

13. Page 40 - Leaching of Water - The environmental statement discusses the possibility of leaching from the ash disposal area and the effluent pond into the ground water, but it does not present data on the probability of this occurring or the actions that will be taken to prevent such occurrence. More information on this subject, including the geology of the affected areas, would be useful in evaluating this possible impact.

14. Page 56 - Cumulative Impact - The environmental statement calls attention to the possibility of cumulative impacts under the Cumulative Impact section; however, there is no cross-reference to the probable dispersion of emission under subparagraph c, Disbursement of Emissions, on page 35. There currently is much interest in the subject of cumulative impact of flue emissions. We suggest this problem should be given more adequate treatment.

15. Page 64 - To assure mitigation of the environmental impact, the following paragraph is suggested for adoption by the companies and for inclusion at the beginning of Chapter VII, Measures Taken to Enhance, Protect, or Mitigate Impact:

Construction specifications will require the contractor to exercise care in preserving the natural landscape and to conduct his construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings. Also, all work areas shall be smoothed and graded to conform to the natural appearance of the landscape.

Sincerely yours,

G G Stamm

For Ellis L. Armstrong
Commissioner

cc:
Bureau of Land Management
Washington, D. C.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
WASHINGTON, D.C. 20240

ADDRESS ONLY THE DIRECTOR,
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Memorandum

To: State Director, Bureau of Land Management,
Cheyenne, Wyoming

From: Acting Director, Bureau of Sport Fisheries and Wildlife

Subject: Jim Bridger Thermal-Electric Generation Project--Draft Environmental Impact Statement, dated September 30, 1971

The subject draft environmental impact statement comprehensively and objectively describes environmental impacts and alternatives of the proposed powerplant and related facilities. However, the statement does not adequately relate the short-term use to the long-term productivity nor does it adequately describe the irreversible or irretrievable commitments of resources.

Some specific comments on the statement follow:

On pages 19 and 21, under "Major Ecological Relationships", the statement should list the area's important sport fishes and wildlife to more accurately describe these life zones.

On page 19, under "Major Ecological Relationships", second sentence, after "antelope;" add "winter feed for mule deer;" and after "and nesting sites for sage grouse (year round habitat;" add "critical hunting grounds for raptors (golden and American bald eagles);".

At the top of page 26, the list of species should be revised to read, ". . . blackfooted ferret, greater sandhill crane, Colorado River cutthroat trout, prairie falcon, American peregrine falcon and American bald eagle." Please note the corrected spellings. Also, we submit that the Colorado River squawfish is not now found in the Green River above the mouth of the Yampa River in Colorado, and we question whether the tule white-fronted goose ever visits the affected areas of Idaho and Wyoming.

On page 44, under "Flora and Fauna", we suggest that you include a more complete statement on the impacts of the plant and its appurtenant structures on all the wildlife. Though number of animals affected is small, the impacts should be described more definitely. The impacts of the secondary effects on fish and wildlife, such as increased housing, increased access, and increased human activity, also should be described.

On page 46, under "Flora and Fauna", we suggest that you include a statement to the effect that eagles and other raptors may be electrocuted on the high-tension transmission lines. In addition, there should be a discussion of possible plans and methods which would prevent such losses.

On page 57, the last sentence states that, "Due to the distance between transmission line conductors, there is little or no hazard to large birds perching on the towers." What is the distance referred to in this sentence? This statement should be expanded to include more detail. Recent investigations throughout the West have disclosed that significant numbers of raptors and other birds are killed by electrocution and by striking the wires and towers.

On page 58, the section on research and monitoring should be included under Section VII, "Measures Taken to Enhance, Protect or Mitigate Impacts," following pages 64-66. Any other planned research or monitoring programs, especially those concerning fish and wildlife, should also be described in this section.

On pages 67 and 68, "Adverse Impacts which Cannot be Avoided", the adverse impacts of the project on fish and wildlife should be restated. Though the section describes disturbances of the lands, it does not relate these impacts to the fish and wildlife resources.

As an example, bird mortality which would occur as a result of flying into wires and towers should be included as an adverse condition which cannot be avoided.

On page 69, "Short-Term Use vs Long-Term Productivity", we believe has been misinterpreted. The project construction impacts on the environment (the short-term uses) should be related to the long-term impacts and productivity. To do this, both pre- and post-project conditions should be described as they relate to the short-term uses and the long-term productivity.

On pages 50 and 64, we suggest that increased emphasis be placed on the use of the surge basin for fishery purposes. If the Wyoming Game and Fish Commission has worked out a plan for a surge-basin fishery with the Pacific Power and Light Company, the plan should be acknowledged and described.

It is understood that a River Basin Studies report will be prepared by the Bureau of Sport Fisheries and Wildlife on the pipeline right-of-way. If the surge basin is built on public domain, provision for fishery use should be recommended on the reservoir right-of way under authority of the Fish and Wildlife Coordination Act.

Page 71, "Irreversible and Irretrievable Commitment of Resources", In addition to the commited mineral and water resources which are considered irretrievable, the fish and wildlife production that will be lost due to the project also are irretrievable and should be described in this section. Though these resources are renewable, the annual production foregone is irretrievable.

We appreciate this opportunity of commenting on the environmental statement.

Willis King

United States Department of the Interior
BUREAU OF RECLAMATION
ENGINEERING AND RESEARCH CENTER
BUILDING 67, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

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REFER TO: 1220

DEC 28 1971

To: State Director, Bureau of Land Management, Post Office Box 1828, Cheyenne, WY 82001

From: Chief, Division of Atmospheric Water Resources Management

Subject: Second draft of environmental statement for Jim Bridger Project

We have reviewed the second draft of the environmental statement prepared for the Jim Bridger Project, Wyoming, as transmitted by Mr. J. R. Lowe's letter of October 27, 1971.

Meaningful comparisons between the two methods of computing the generating plant's stack emissions are difficult to make because of the different assumptions involved in the two methodologies employed. However, no serious discrepancies are apparent between the methods. The Tennessee Valley Authority analysis is the more conservative of the two in that it indicates that the State of Wyoming air quality standards for oxides of nitrogen can be exceeded under certain meteorological conditions. However, the analysis assumed the worst possible combination of ingredients in the coal. Provision of NO_x control facilities would probably reduce the emissions to an acceptable level even when such a combination of ingredients exists.

Archie M. Kahan

In duplicate

Copy to: Commissioner

United States Department of the Interior

GEOLOGICAL SURVEY
WASHINGTON, D.C. 20242

OFFICE OF THE DIRECTOR

December 29, 1971

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Mr. Edward L. Hastey
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Hastey:

We were pleased to find that Geological Survey Circular No. 645 was used as a guide in the preparation of the draft environmental statement on the Jim Bridger Thermal Electric Generation Project. We recognize that no environmental impact statement can provide sufficient analysis of all possible impacts, but the general impression is that the statement speaks to the environmental considerations of the project quite well, except as noted below. Since the statement is a long one, it would have been helpful to our reviewers if the expected impacts had been summarized so that the readers could comprehend the gist of the expected impacts of the project more easily. For that purpose, we would suggest that the two matrices, which are now included in an appendix, be moved forward in the report and be included with a sort of summary statement, which would follow immediately after a very general description of the project itself. The matrix analysis has the advantage of affording readers the ability to tell immediately what the initial appraiser feels are the major points to be covered in the environmental impact statement. We believe, in the particular case of the Jim Bridger statement, that the initial draft statement could have been better presented, had the Geological Survey been consulted during this stage of the analysis.

Specific comments on the hydrologic and geologic considerations follow:

Operation of the powerplant will require disposal of ash and blowdown water, both of which are potential sources of chemical contamination of ground-water and surface-water supplies. Present plans call for burial of blowdown residue and bottom ash in the strip mine from which the coal supply is obtained. No data are available on the chemical character of the ash and residue, or on the direction and rate of ground-water movement in the area. The matrix and impact-assessment statement in Appendix B of the report

are incomplete in that no effects of powerplant operation on ground-water supplies are indicated. A system of monitoring wells around the disposal pits would seem to be called for, but no recommendation for such a system is made in the report. In fact, the statement is made (p. 41): "The study team is not aware of any monitoring systems for movement of contaminants in the ground water from operations of this nature." Further, no mention is made of whether waste water will be evaporated in ponds or returned to the stream system. As the report states, this water could damage aquatic life and surface vegetation. (It could also increase dissolved solids in surface and subsurface water supplies.) It would seem, therefore, that definite plans should be made for disposal of liquid and solid wastes from plant operation in such a manner as to minimize potential contamination, and a monitoring network should be established to detect effects of waste disposal on both surface-water and ground-water supplies.

The effects of coal mining on surface-water quality are rated as minor in magnitude and importance, and the effects on the quantity of streamflow and on ground water are not assessed. On page 53 appears the statement: "Tests to date indicate that the mine operations are not expected to encounter underground water." The nature of the tests is not explained. As in the powerplant area, a monitoring system of both wells and stream-gaging and sampling sites should be established to assess the hydrologic effects of the mining operations; not all these effects may prove to be minor.

The method of handling the overburden in the strip-mining operation is described on page 3 as follows: "The overburden from the next strip will be deposited in the trench created by earlier stripping." There is an inadequate description on page 67 of what landscaping effort will be made to bring the terrain of the stripped area into harmony with the natural undisturbed terrain. Efforts should be made to avoid adverse new patterns of erosion and deposition that might result from the strip-mining operations, as well as to restore a terrain pleasing to look at. The imposed Federal and State rehabilitation requirements (page 53) of the strip-mining operations should be described. The implication on page 66 is that it might simply consist of revegetating the spoil piles. The pending reclamation of the area during coal mining operations (page 55) should also be described.

J R Balsley

Acting Director

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
WASHINGTON, D.C. 20242

IN REPLY REFER TO: 175

Memorandum

JAN 7 1972

To: Associate Director
Bureau of Land Management

JAN 10 1972

Through: Deputy Assistant Secretary
Public Land Management WL

From: Commissioner of Indian Affairs

Subject: Second Draft Environmental Impact Statement for the Jim Bridger Thermal-Electric Generation Project

Pursuant to your request of October 26, 1971, the Director of our Billings Area Office has reviewed the subject and comments as follows:

"The basic elements of the Jim Bridger Thermal-Electric Complex include a distribution system of three 34.5-kv transmission lines running for some 235 miles; a 1,500 MW coal-fired steam electric plant; a strip mine which will take between 100 to 150 million tons of coal in the next 35 years, and a 42-mile water pipeline together with additional railway and highway construction which will facilitate the operation.

The stage at which environmental impact studies are required necessitates a review of the planning which is weakly supported by data, and this is particularly true on emissions into the air and possible water pollution. The statement indicates that plans for continuing surveillance and expected technical improvements may very well lead to improvements in environmental protection not now contemplated.

We would have preferred to see the transmission line run south of Seedskadee Wildlife Refuge but must accept at face value the insulator corrosion damage problem posed by the trona plant

nearby. We concur in recommendations of John T. Goodier, Chief of Mineral Development, Department of Economic Planning and Development for the State of Wyoming, as they pertain to two suggested changes in the waterline route in the White Mountain area."

Acting Deputy Commissioner

FEDERAL POWER COMMISSION
WASHINGTON, D.C. 20426

January 13, 1972

Routing & Date
SD
ASD
2 PCS
OPA
/ RES.
TECH. S.
MGMT. S.
LEAD RESP. /

State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

This is in reply to your letter of October 26, 1971, requesting comments of the Federal Power Commission on the second draft of the Environmental Impact Statement for the Jim Bridger Thermal-Electric Generation Project to be constructed by the Pacific Power & Light Company and Idaho Power Company. The project is to consist of three 500-megawatt coal-fired units, three 345-kilovolt transmission lines, a 42-mile underground water pipeline, and a coal mining operation.

These comments are in accordance with the National Environmental Policy Act of 1969 and the Guidelines of the President's Council on Environmental Quality dated April 23, 1971. The environmental aspects of the proposed project must be analyzed thoroughly. We understand that will be done. These comments are directed solely to a review of the need for the facilities as concerns the adequacy and reliability of the bulk electric power system and alternates to the methods proposed to be used. They are based on the second Draft Environmental Impact Statement dated September 30, 1971, prepared by the Bureau of Land Management; data available to the Commission in the annual Power System Statements, FPC Form 12; and data submitted by the Western Systems Coordinating Council in its April 1, 1971 response to FPC Order No. 383-2 concerning the adequacy and reliability of electric service. In particular our comments will be directed to the need for the capacity of the proposed Jim Bridger Generating Station and the associated transmission lines by the Applicant's system and by the Pacific Northwest Power Pool of the Western Systems Coordinating Council.

The Need for Power

The Jim Bridger Generating Station is to be located 35 road miles northeast of Rock Springs, Wyoming and six miles north of Interstate Highway 80. The plant is to consist of three 500-megawatt coal-fired units. The first unit is scheduled for commercial service in June 1974 and Units No. 2 and 3 in 1975 and 1976 respectively. The Idaho Power Company is scheduled to receive the power generated by Unit No. 1, and the Pacific Power & Light Company will receive the power generated by Units 2 and 3.

To transport the power to market, the project includes three 345-kilovolt transmission lines extending westward 235 miles to substations in the vicinity of Pocatello, American Falls, and Idaho Falls, Idaho.

The proposed project was planned as part of the "20-Year Hydro Thermal Program" of the Pacific Northwest's Joint Power Planning Council, a coordinating group composed of 109 electric utilities including the Bonneville Power Administration. The capacity of the Jim Bridger Generating Station is intended not only to meet the needs of the Applicants but also to help fulfill the Applicants' commitments to the regional coordinated program which envisions by 1980 the need for 21,000 megawatts of new generating capacity.

In view of the intended markets for the power from the proposed generating station, the need of its capacity can be judged against the demand-supply situation as it is expected to develop in the system of the Idaho Power Company in particular and the Pacific Northwest in general. According to the Draft Environmental Impact Statement, the Idaho Power Company is currently in need of the capacity of the proposed project. This is confirmed by the Company's 1970 Annual System Statement which shows that on December 31, 1970, the net dependable capacity owned by the Company was 1,226 megawatts while its annual peak load was 1,201 megawatts, representing a reserve margin of 2.1 percent. At the time of the 1974 summer peak, the Company's peak load is expected to reach 1,590 megawatts while available resources (those owned by the Company and net transfers) are expected to be 1,496 megawatts. This is a deficiency of supply over demand of 94 megawatts or a negative reserve margin of 5.9 percent without the Jim Bridger No. 1 Unit. If the No. 1 Unit is on the line as planned, the Company should meet the projected 1974 summer peak with a reserve of 406 megawatts, a reserve margin of 25.5 percent. Since the No. 1 Unit is now planned for June 1974 and the Company's annual peak usually falls in July, even minor slippage in the completion date of the unit would force the Company to depend on the Northwest Power Pool to meet its obligation to its customers.

Based on the information available, the capacity of the Jim Bridger Generating Station is needed by the Idaho Power Company in 1974.

According to data submitted by the Western Systems Coordinating Council, the estimated demand-supply situation of the Pacific Northwest Power Pool during the winter peaking season of 1974-75 will also be precarious. Against an estimated demand of 31,178 megawatts, the Pool can look forward to only 33,847 megawatts of dependable capacity including net transfers but excluding the capacity of Unit No. 1.

Under these circumstances, the reserve margin will be 2,669 megawatts or 8.6 percent. When the capacity of Unit No. 1 is added to the expected resources of the Pool in 1974, the expected reserve margin is increased to 10.2 percent.

For the 1975-76 winter peak, the generating reserves of the Pool are expected to increase to 4,065 megawatts, excluding the Jim Bridger Units No. 1 and 2, representing a reserve margin of 12.4 percent. With both units in service, the resulting reserve margin is 15.4 percent.

For the 1976-77 winter peak, the Pool reserve margins are projected to be 9.9 percent without Units 1, 2, and 3 and 14.2 percent with all three in service.

The Pacific Northwest Power Pool data submitted in response to FPC Order 383-2 show that approximately 91 percent of its generating resources were hydroelectric in 1970. By 1980 this percentage is shown to decrease to 83 percent as more thermal resources, such as the Jim Bridger Plant, are installed. The large number of small to moderately sized hydroelectric units make it possible to achieve a similar degree of reliability and adequacy of service with a lower percent of reserve margin capacity than a predominantly thermal system where the generating resources are concentrated in large, sophisticated steam-electric units. Nevertheless, in the case of the Pacific Northwest Power Pool whose network extends over large distances and difficult terrain, the staff of the Bureau of Power considers the reserves indicated to be too low to inspire confidence in the ability of the Pool to maintain reliable service and fulfill its power commitments. Furthermore, past experiences indicate realistic possibilities of construction delays in either the generating units, water pipeline, or mining operation involved in bringing this plant into service, as well as similar possible delays that could affect other bulk power system planned additions.

The preceding discussion is summarized in the following table:

	Idaho Power Company (Main System)	Northwest Power Pool of the Western Systems Coordinating Council		
	Summer 1974	Winter 1974-75	Winter 1975-76	Winter 1976-77
Excluding Project				
Dependable Capacity, Megawatt (Includes Net Transfers)	1,496	33,847	36,956	38,105
Estimated Demand, Megawatt	1,590	31,178	32,891	34,648
Reserve Margin, Megawatt	-94	2,669	4,065	3,421
Percent of demand	-5.9	8.6	12.4	9.9
Including Project as Scheduled				
Reserve Margin, Megawatt	406	3,169	5,065	4,921
Percent of demand	25.5	10.2	15.4	14.2

Project Transmission Lines

The three 235-mile 345-kilovolt transmission lines associated with this project are the consequence of the remote site of the Jim Bridger Generating Station. The lines are necessary to transport station power to the load centers of Idaho Power Company and to connect with the network of the Pacific Northwest Power Pool. If the site of the proposed plant had been placed closer to the load centers of southeastern Idaho, transmission requirements would have been less, but this advantage does not compare favorably with the advantages of mine-mouth siting of the generating facilities. The proposed transmission lines will strengthen the complex transmission network of the Pacific Northwest and thereby will contribute to the stability of the entire network in times of emergency.

Alternates to the Proposed Project

Of all the alternates to a coal-fired generating station in the general area of the proposed site, none appears to offer a practicable substitute or environmental and economic advantages superior to those of the proposed Jim Bridger Generating Station. Consideration of a number of smaller installations offers no advantage over higher operating efficiencies and efficient environmental protection equipment practical in the large central station. This alternative was considered

by the Idaho Power Company and was rejected in favor of a large station with its economies of scale and one whose cost could be shared with another utility system.

Oil and gas fuel as a substitute for coal in a station as large as the proposed project was not considered practicable because of the comparative scarcity and high cost of these fuels in the West. Geothermal generation while practiced in California is relatively unexplored in the Pacific Northwest. Nuclear generation is not a feasible alternative to the proposed station because of the immediacy of the need for the proposed capacity and the long lead time required to design and construct nuclear generation.

Time also mitigates against a hydroelectric alternate. Undeveloped hydroelectric sites exist along the middle Snake River, Salmon River, Clearwater River and the middle Columbia River, but it is highly improbable that such sites could be developed within the time available to meet projected power needs. Further, the Jim Bridger Plant is planned to be operated as a base-load facility, whereas hydroelectric developments are now generally showing greater economic worth as peaking facilities.

An adequate and reliable supply of electric power is not assumed under the potential situation as outlined for the Idaho Power Company and the Pacific Northwest Power Pool without the additional capacity such as the Jim Bridger unit could provide. The potential consequences of not having sufficient electric power in the Pacific Northwest are serious and would include the inability to meet the important power needs of residential, commercial, and industrial consumers.

Very truly yours,

T. A. Phillips
Chief, Bureau of Power

United States Department of the Interior

OFFICE OF OIL AND GAS
WASHINGTON, D. C. 20240

1 ASD
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2 RES.
TECH. S.
MGMT. S.
LEAD RESP. 2

JAN 19 1972

Mr. Daniel P. Baker
State Director
Bureau of Land Management
Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

We have reviewed the second draft of the Environmental Impact Statement for the Jim Bridger Thermal-Electric Generation Project and consider it well prepared and well documented. Using the procedure for evaluating environmental impact outlined in U.S. Geological Survey Circular 645 is, we think, commendable. There are only minor suggestions or changes that we would recommend.

Your remarks on page 10, section 5, on oil and gas are, we feel, open to challenge and should perhaps be rewritten before publication.

There is oil and gas production in Wyoming and an extensive refining industry in the Puget Sound area supplied by Canadian crude. In the foreseeable future there is also the possibility of supplying this area with Alaskan oil and gas, although it may be at least five years away. Also, there is no legal authority dictating the use to which either oil or gas can be put at this time. The general statement that oil and gas are more expensive than coal cannot be supported since many electric power plants currently use these fuels.

What you may wish to indicate in this paragraph is the fact that we are nearing the limit of our ability to supply oil and gas requirements from the known reserves and that it will be necessary in the long run to make more effective use of our abundant reserves of coal if we are to meet future needs for energy at economically acceptable levels.

We appreciate having had the opportunity of commenting on your statement.

Sincerely yours,

Director Gene P. Morrell

REVIEW: B.L.M. SECOND DRAFT
ENVIRONMENTAL IMPACT STATEMENT FOR THE JIM BRIDGER THERMAL-ELECTRIC GENERATION PROJECT

by

WYOMING GAME AND FISH DEPARTMENT

A review of this draft impact statement along with the circumstances surrounding the development of the Bridger Project requires several basic assumptions to keep all things in proper perspective.

We must assume that this impact statement was meant to fulfill the requirement of the Environmental Act of 1969, to requiring that all possible impacts of committed uses of public lands be determined, presented to public scrutiny and evaluated in determining whether or not the resources should in fact be so committed, and if so, what protective measures should be applied to minimize any and all unavoidable impacts --to mitigate in some manner for the loss of, destruction of, or waste of other resources that cannot be avoided.

As is stated in item 2 of the summary, "The plant is presently under construction on private lands northeast of Rock Springs, Wyoming." In fact, ground breaking ceremonies were held on June 10, 1971. It is also stated in the second paragraph of this item ("Two rights-of-way, one for a 7-mile spurline railroad, the other for a short 34.5KV powerline were issued previously by the B.L.M. after an analysis indicated there were no significant environmental impacts involved").

It is further stated therein, that "... this report is submitted prior to issuing any further rights-of-way for this project." Also, as is stated, "In Wyoming, more than half of the land involved in the project is administered by the Bureau of Land Management. Federal grants or use permits in the form of rights-of-way are necessary before power line construction can proceed."

The indication is that the only portion of this entire project that remains open for disapproval or alteration based on environmental impact determination is the distribution system consisting of three 34.5KV transmission lines connecting the plant with substations 235 miles to the west.

We have, however, been assured by the B.L.M. that the issuance of these remaining premits could yet be effected as restrictions, location, or even not be issued depending upon the determination of impact.

In this light, and to be considered pertinent to influencing operational methods and mitigation of losses of other values, we have reviewed the draft in the interest of wildlife in the area.

In general, there appears to be a lack of information concerning the impact on fish and wildlife. To give a true picture of the impact, values to fish and wildlife must be considered from current populations using the affected areas during one or more seasons of the years, areas of critical value to one or more species, and potential value of the areas to be effected to future development and management of

wildlife species. To facilitate this evaluation and total impact on wildlife, the total area or acreage of impact of all phases of the Bridger Project should be tabulated.

The area of the location of the power plant and the mine location is a very important winter range for antelope. During the period just prior to December 14, 1971, which is considered a severe winter, over 1,200 antelope were actually counted in this area. The estimate of our district Big Game Biologist places the winter population for the area at approximately 2,000 head. His estimate for a mild winter is that 600 to 800 head of antelope winter in this area. A determination of the total population of antelope and other species that would be effected by the entire project is not feasible without knowledge of the exact location and the total area to be involved.

On page 19, under 1b, "Major Ecological Relationships", there is mention of the existence of current "critical winter use by antelope" and use of the area by sage grouse for year round habitat including nesting sights, feed and cover. No mention is made, however, in this section, of the year round use of the area by deer and other wildlife species. Nor is the potential of the area for use by chukar partridge, cottontail rabbit, and other species taken into account.

Again, on pages 21 and 22, under 2b, an indication is given of the critical value of the area to existing elk and deer population, but determination of impact is minimized by injection of effects of prior land use practices, and no consideration is given to potential values of the area for wildlife development.

On page 50, under C3, it is indicated that "Growth of aquatic plant life in the surge pond could be beneficial to a fishery or to waterfowl populations." It is also mentioned that the surge pond would provide a permanent water supply which would be beneficial to all wildlife in the area. However, no consideration is given to the probable need for treatment of the surge pond to decrease the algae form of aquatic plant life to accomodate the use of the water for the power plant. If treatment is needed, the effect could negate any and all beneficial use of the pond for fish and wildlife and could in fact result in total destruction of those forms of wildlife which are now in the area and those that may be introduced or attracted into the area as a result of the water supply. If, however, the water supply is found to be non-toxic and beneficial to wildlife, there would result a concentration of wildlife in the area of the surge pond and development of a fishery in the pond proper, however, these items may be problematic. To be even more beneficial, any potable water supply should be further dispersed for use of wildlife and domestic livestock.

On page 54, under D4, it is mentioned that a slight impact is expected on wildlife as a result of short-term displacement in the area of the stripmine. It is also indicated that reclamation of the area should offset these detrimental impacts. This equilibrium is also indicated in the matrix numerical evaluation. However, no apparent value is attached to the "short-term displacement" of wildlife. It must also be realized that revegetation must consider the needs of wildlife species. If increased wheatgrass and ryegrass, etc., are used, this cannot be considered a benefit to wildlife.

The companies involved are to be commended for concern of reclamation problems as is indicated on page 66C, in that they have contracted with Dr. Morton May of the University of Wyoming Plant Science Division to research and evaluate the impacts of the plants on surrounding ecology and to develop methods for re-vegetation of spoil banks. It is also encouraging to know that indications from studies at the Kemmerer Coal Co. Strip Mine are that re-vegetation of woody species is possible. In addition, re-vegetation should consider dry land alfalfa and some forbs such as the Astraglus spp for wildlife use.

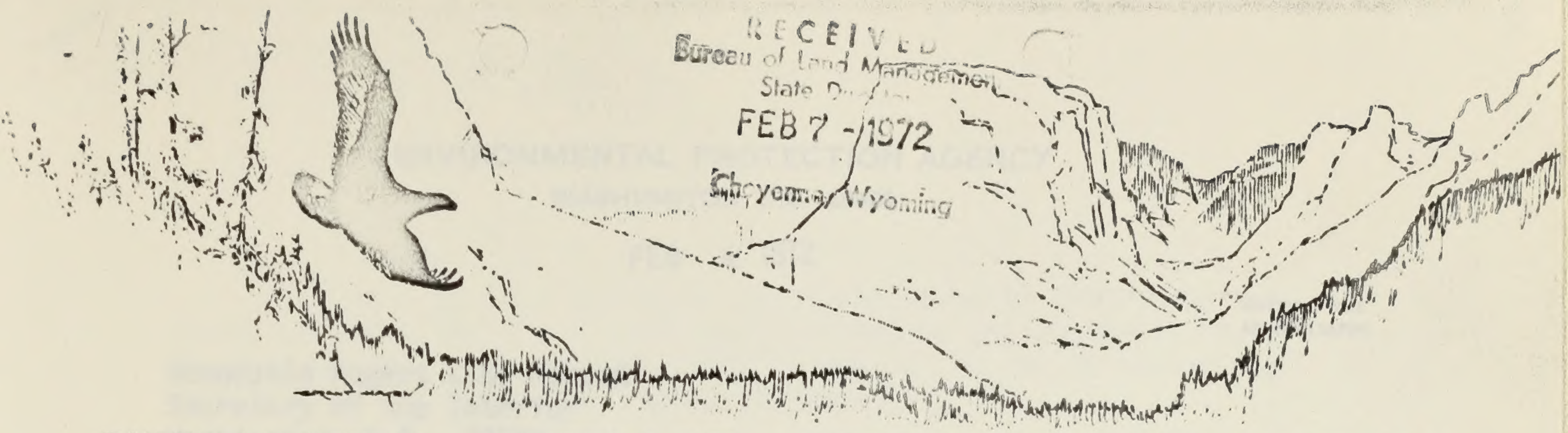
Under part VII, pages 64-66, there is no mention of a measure to prevent loss of fishes through the intake and pipe line. This is in disregard to the fact that there has been some discussion between representatives of Pacific Power and Light Co., and field representatives of the Game and Fish Commission regarding electrical screening, off channel intake baffle systems to implement minimal effect upon the stream fishery. Some type of screening or other device should be used which would prevent the intake of fish of all sizes to the water supply system.

In summary, impacts on wildlife in the area are covered in the B.L.M. Red Desert Study as areas of conflict.

Nearly all resource recommendations for wildlife habitat in this study apply in this area, and the rationale presented are pertinent.

Thank you for the opportunity to review and comment on this draft.

James B. White
State Game and Fish Commissioner



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Cheyenne, Wyoming

WYOMING OUTDOOR COORDINATING COUNCIL
P. O. BOX K LANDER, WYOMING 82520

February 4, 1972

Routing 2/7/72	Initial & Date
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Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Dan:

I have become more and more bothered by some of the environmental implications of the Jim Bridger plant which seem not to have been adequately explored in the initial draft of the environmental impact statement. Part of the inadequacy obviously stems from lack of availible information. This absence of data is in itself cause for genuine concern.

Information availible to us would indicate that the coal at the Bridger site at least in part has levels of fluorine which could be of very genuine concern. To this must be added the quantity of fluorine which would be present in the Green River water consumed in cooling and steam generation.

It would seem to us that consideration should be given to requiring thorough analysis and evaluation of quantitative and qualitative factors with respect to lead, mercury, fluorine and the heavy metals including selenium by independent public and private concerns.

We believe that the above factors are of such significance as to justify public hearings in perhaps Casper, Laramie and Pocatello. It would seem that now is the time to evaluate these factors before additional major coal generating plants are commenced.

Sincerely,

Keith

Keith V. Becker

cc: Bob Sundin
Laney Hicks
Jerry Jayne
Bruce Ward

ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 4 1972

OFFICE OF THE
ADMINISTRATOR

Honorable Rogers C.B. Morton
Secretary of the Interior
Washington, D.C. 20240

Dear Mr. Secretary:

We have reviewed the draft environmental impact statement for the Jim Bridger Thermal-Electric Generation Project, transmitted to the Environmental Protection Agency on September 30, 1971. The evidence available to us at this time indicates a number of problem areas which should be discussed thoroughly in the final environmental impact statement.

Because of the geographic location of the Jim Bridger Project and its similarity to other power plants in the Southwest Energy Study, EPA believes that the Department of the Interior should include the Jim Bridger Project in that study. Even though the electrical power from Jim Bridger will be exported to the Northwest versus the Southwest for the other six power plants, the potential pollution from Jim Bridger could contribute to the environmental deterioration of that geographic area. As you are well aware, the Southwest Energy Study is nearing completion, and insofar as information from the study is pertinent to the environmental impact, such information should be included in the final version of the Jim Bridger environmental impact statement. At this time, EPA plans to comment on the final environmental impact statement after completion of the Southwest Energy Study.

The enclosed comments discuss in detail the following areas where the draft impact statement lacks information, or where the project as now planned could have particularly adverse environmental effects.

1. SO_2 removal.
2. Design of the stacks and air pollution abatement equipment.
3. Mineral or chemical content of the ash.
4. Emission rates of heavy metals and radionuclides.
5. Synergistic effects of pollutants, particularly stack effluents and cooling tower plume interaction.
6. Effect of emissions on adjacent air quality regions.
7. Disposal of solid wastes and cooling water blowdown.
8. Impact of strip mines.
9. Ozone production.
10. Power line location alternatives.
11. Monitoring systems.

We appreciate your giving us additional time to comment on the draft statement while our staff was involved in the Southwest Energy Study. We hope these comments will be helpful to you in preparation of the final environmental impact statement.

Sincerely yours,

William D. Ruckelshaus

William D. Ruckelshaus
Administrator

Enclosure

Enclosure to letter to Honorable Rogers C.B. Morton

ENVIRONMENTAL PROTECTION AGENCY

Detailed Comments on Draft Environmental Impact Statement

Jim Bridger Thermal-Electric Generation Project

1. The draft environmental impact statement on page 34 gives the maximum daily emission of SO_2 for one 500 MW unit as 94.1 tons SO_2. For the 1500 MW plant (by 1977), that would mean nearly 282 tons of SO_2. The statement also mentions that there are no plans to install sulphur dioxide removal equipment "initially", but that it may be installed "in the future if necessary". EPA does not accept the philosophy that one should wait until there is an air quality problem before installing removal equipment. With the long lead time for this type of equipment, and the substantial SO_2 which will be produced at the 1,500 MW level, steps should be taken to incorporate SO_2 removal equipment into the original design of the plant, rather than attempt to retrofit.

2. The statement indicates that the final design of the stacks and air pollution abatement equipment have not been specified yet. Those designs must be specified in the final statement if the air pollution effects of the plant are to be properly evaluated.

3. The statement says on page 40 that "There are no data currently available on the mineral or chemical content of the ash and residue from the generation plant. . ." Such data must be developed if the detrimental effects of the ash are to be completely evaluated.

4. There is insufficient discussion of the emission rates of heavy metals and radionuclides from the plant. For example, for mercury, the statement mentions that (page 35) spectrochemical analysis indicated the absence of mercury in core samples, but gives no figures. If we look at the plant over its entire life, 100-150 million tons of coal will be consumed (page 71). Even if mercury were present in the low concentration of 50 parts per billion, this would mean some 5 to 8 tons of mercury would be discharged into the environment.

5. The possibility of synergistic effects of the pollutants and the possible effect of the interaction of the cooling tower plume with the stack effluent should be discussed. Page 56 refers to the possibility of synergistic effects, but there is no further discussion -- nor mention of studies underway.

6. According to page 35, " . . . emissions are expected to drift east over the Continental Divide . . . to mix in the Denver-Casper-Cheyenne regional airsheds." To evaluate the effects of this, EPA needs to know whether and how this would affect the air quality control plans for the Denver air quality region. Colorado, like the other States, has developed implementation plans as required by the Clean Air Act of 1970.

7. More information is needed concerning the disposal of solid wastes and cooling water blowdown. Data should be provided to show that surface runoff resulting from severe flood conditions can be kept from eroding the bottom ash and blowdown salt deposits. If the bottom ash and salts were to enter streams, serious ecological damage would result. Also, more information should be provided to indicate that no salts will leach into the underground water table. Presently, the statement indicates that there is no information on the depth, rate of movement, or direction of flow of the ground water (page 40). It also mentions that there are presently no monitoring systems for the movement of contaminants in the ground water from the power plant and mining operations (page 41).

8. The environmental impact of the strip mine operation is similarly lacking in necessary information to permit assessment by EPA. For instance, it states that "revegetation requirements provided for in Federal stipulations . . . should offset detrimental impacts," but then continues "it is noted, however, that the existing coal leases were issued prior to the effective date of the Title 23 regulations." Thus, it is not clear whether the Federal stipulations of Title 23 will be adhered to or not (page 54).

Further, for State rules and regulations, the statement mentions that "a plan of reclamation may be submitted to the Commissioner of Public Lands for his acceptance" (page 54). Such a plan of reclamation should form part of the final environmental impact statement.

9. Ozone is produced as a result of the design corona losses from high voltage lines. Calculations available to us would indicate that about three pounds of ozone would be generated per mile per day at a design corona loss of four KW per mile. Ozone is receiving increasing attention as an important environmental pollutant. It can have a significant human health effect, can seriously damage plant life, and is a prime indicator and component of photochemical smog. With the increasing proliferation of high voltage transmission lines, this problem should be further studied and deserves attention in the final impact statement for this project.

10. The statement mentions that " . . . the existing 230 KV wood H-pole is poorly located by today's standards" (page 15). For that reason, the proposed 345 KV lines are to follow a different routing. On the other hand, the 230 KV lines are already in place, and it is not clear whether there are plans for their relocation or replacement. If not, using the existing rights of way would be a possibility for minimizing additional impacts. Similarly, using the existing 161 KV route may be able to minimize additional impact, unless it is planned to relocate or replace that line (page 17). Overall, it is not clear in the statement why the proposed routes for the 345 KV lines are better than the other alternatives.

Even if the proposed route is shown to be superior, it appears that more improvements are possible. For instance, from the map of the transmission system (Exhibit I), it appears that the Seedskadee Wildlife Refuge could easily be avoided. Additional alternatives should therefore be analyzed to ensure the optimum route is selected.

Although we will defer any final determination to the Bureau of Sport Fisheries and Wildlife, we wish to point out that if a single support tower design utilizing guy wires is used in the wildlife refuge (page 64A), the fine guy wires could endanger flying birds. Perhaps a different type of self-supporting tower could be used.

11. The statement gives virtually no discussion to the need for, and the design of, a comprehensive air and water monitoring system. Such on-going monitoring is essential to insure that the plant is not degrading surface or ground waters or breaching air quality standards. It will also provide a data base which can guide the design of any subsequent units at the site. The statement cites numerous uncertainties but does not indicate a plan to resolve the lack of data.

ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF THE
ADMINISTRATOR

14 FEB 1972

Mr. Bruce Blanchard
Department of the Interior
Room 5321
Washington, D.C. 20240

Dear Mr. Blanchard:

This is in further response to your request for comments on the draft environmental impact statement for the Jim Bridger Thermal-Electric Generation Project, transmitted to the Environmental Protection Agency on September 30, 1971. This supplements our comments transmitted to you on February 4, 1972. We regret that we neglected to make these points in that letter and hope this will not cause you any inconvenience.

Item 1 in the enclosure to our letter of February 4 should have pointed out that the principal basis for our desire to see SO_2 removal equipment included in the initial design of the plant is that the maximum expected SO_2 emissions shown on page 34 of the draft statement would exceed EPA's new source performance standards.

In addition, the following item 12 should have been added to the enclosure:

12. The statement does not discuss any possible cumulative air pollution effects which may result from other non-project-related sources, particularly the trona plants west of Rock Springs, Wyoming.

I would appreciate the inclusion of these additional comments in the final environmental impact statement for the Jim Bridger Project.

Sincerely,

Sheldon Meyers

Sheldon Meyers
Director
Office of Federal Activities

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EXHIBIT I

Preliminary Analysis of Meteorological
Conditions at the
Jim Bridger Plant Site

An independent analysis and predictive
model prepared by the Bureau of Reclamation
working with the Tennessee Valley Authority

Appendix A

Meteorological Studies

Dispersal of the stack emissions attendant to thermal-electric power generation depends largely on the motions of the atmosphere at and downwind from the plantsite. The direction and intensity of these motions are subject to considerable variation. Migratory largescale pressure systems combine with local terrain effects and the daily cycle of solar radiation to provide a wide range of dispersal conditions. Prediction of surface concentrations of stack emissions requires detailed meteorological inputs. The vertical temperature distribution and winds at the surface and aloft are important considerations. While much useful information can be inferred from general knowledge of the behavior of the atmosphere, and analyses of long-term observations taken at stations in the same geographic region, there is no completely valid substitute for extensive meteorological observations taken in the immediate vicinity of the plant site.

Analysis of dispersal conditions at the Jim Bridger Thermal-Electric Generation Project benefits from long-term upper air observations taken by the National Weather Service at Grand Junction, Colorado, and Lander, Wyoming, and from surface observations taken at airports serving nearby Rock Springs, Wyoming. Valuable as these data are, they need to be calibrated against observations made at the actual project site. In recognition of this fact, Idaho Power Company and Pacific Power and Light Company engaged Western Scientific Services, Inc. (WSSI) to study the site meteorology.

On-Site Meteorological Program

The agreement between the Companies and WSSI provided for the erection of a 200-foot high tower with continuous recording of wind speed and direction, temperature, and dewpoint at the 200-foot, 100-foot, and 20-foot levels, as well as a recording solar radiometer.

The contract also required a series of 10 two-week studies every two months to describe the vertical variation in wind speed and direction, the influence of local terrain on airflow over the plantsite, and the characteristics of the diurnal surface inversion as related to the depth of the mixing layer. Studies have been conducted during September 10 through 27, 1970; November 3 through 11, 1970; February 16 through 24, 1971; April 8 through 13, 1971; and June 19 through 24, 1971. A total of 40 days of detailed observations have been accumulated.

Data collected included surface meteorological observations, serial pilot balloon observations to describe the vertical wind structure, and serial constant volume balloon observations to describe air parcel trajectories for selected meteorological regimes. Vertical temperature structure is determined by flying a specially-equipped light aircraft from 300 feet above the ground to 10,000 feet in a tight spiral over the plantsite.

Results to Date

A preliminary analysis of the meteorological observations has been made for the purpose of this statement. A more complete analysis will be presented to the Companies in late 1972.

The wind velocity and direction at the surface near the Jim Bridger site corresponds with the flow pattern depicted on standard weather maps primarily during daylight hours, but can occur at any time when the large-scale weather features are sufficiently strong to control the airflow throughout a well-mixed layer extending from the surface of the earth upward for several thousand feet.

When the earth cools off at night, a layer of cool, stable air may develop near the earth's surface. Within this layer, the wind velocity is much lower and the direction can vary considerably from that found above the stable air. At the plantsite, this stable air layer occurs nightly except when strong winds associated with major weather features are present. The stable layer forms about sunset when surface cooling begins and slowly deepens during the night. Breakup of the stable layer depends upon the depth of the layer and the amount of surface heating. Breakup is very rapid, but if surface winds are light and a cloud cover prevents surface heating, the stable layer can persist throughout the day.

The stable layer averages about 600 feet in depth. When a high pressure system dominates the area and the light winds and clear skies characteristic of such systems allow strong radiation cooling, a stable layer as much as 1,600 feet deep can form. This happens about 3 percent of the time.

Very unstable or moderately unstable weather conditions rarely occur at the Jim Bridger plantsite. Very stable conditions also rarely occur. Slightly unstable conditions occur essentially only in the daylight hours. Neutral stability occurs during the day when the air is

well-mixed and at night when the lack of surface heating prevents vertical mixing. Slightly stable conditions exist during the night, but can persist throughout the day when low clouds and small temperature changes prevent vertical mixing. The absence of a wide, deep valley and the location of the site near the Continental Divide prevents long periods of deep air stagnation.

About 45 percent of the time, wind velocity at the site is between 10 and 20 miles per hour. Only 10 percent of the time is the wind less than five or greater than 20 miles per hour.

Meteorological regimes commonly persist for no more than about six hours. Less than two percent of the time do conditions persist for more than 12 hours. The longest periods of persistence are associated with northeasterly winds.

During the warmer months of the year, the dominant direction of airflow is from the southwest. During the winter months with slightly unstable conditions, winds are about equally divided between southwest and west. During slightly stable conditions, most of the flow is from the southwest, but southeast and northwest flows are not uncommon. Intense storm centers moving from west to east across Colorado cause northeast airflows which can persist for as long as 30 hours.

Fumigation conditions are most likely when a rapid change from slightly stable to slightly unstable conditions when rapid vertical mixing from surface heating occurs. Since slightly unstable conditions are found only about 12 percent of the time, and then predominantly during the summer months, fumigation is not expected to be frequent in the vicinity of the Jim Bridger plantsite.

At the request of the Bureau of Land Management, air quality experts of the Tennessee Valley Authority made modeling studies of diffusion to be expected near the site. Their estimates are shown in the following tables.

Note: During the review process, comments received indicated that the last paragraph on page 4 of this appendix should be clarified. The language suggested by the Companies' consultant follows:

> "One must agree with Williams that the statements concerning fumigation are poorly put. Accordingly, I suggest that the last sentence on page 4 of Appendix C of the Second Draft be deleted and replaced with the following:
>
> "For fumigation to occur the plume must first be contained in a stable atmosphere by an inversion top it cannot penetrate. Eighty-five percent of the winds in stable air regimes at Jim Bridger are less than 1.8m/sec (say 2m/sec) under which conditions effective stack height is 387 meters. On only 6% of these times would the plume not penetrate the inversion top.
>
> "The other 15% of the winds during stable conditions are between 2m/sec and 4m/sec, with a minimum effective stack height of 339 meters, and another 3% of the time during which the plume would not penetrate the inversion lid. Thus, in about 10% of stable air regimes the plume would be restrained by the inversion top. If all of these resulted in fumigation events, our data indicates a fumigation situation would occur on 22 days each year. But for fumigation we must have a transition from a stable to an unstable regime. Unstable conditions exist at Jim Bridger only 12% of the time, in contrast to 37% stable. So a reasonable expectation of fumigation events would be a maximum of seven per year. And when they do occur they would exist for no more than 30 minutes."

Table 1

ESTIMATED MAXIMUM 1-HOUR AVERAGE CONSTITUENT SURFACE CONCENTRATION

JIM BRIDGER GENERATING STATION*

3-Unit (1,500-mw) Operation

Three 500-Foot Stacks

East Sector

Constituent	Constituent Emission Rate (tons/unit/day)	Dispersion Model**								
		Coning			Inversion Breakup			Trapping		
		Concentration (ppm)	Concentration (μg/m^3)	Dist. (mi.)	Concentration (ppm)	Concentration (μg/m^3)	Dist. (mi.)	Concentration (ppm)	Concentration (μg/m^3)	Dist. (mi.)
SO_2	94.5	0.25	542	2.0	0.30	651	4.7	0.33	716	2.0
NO_x	49.7	0.18	281	2.0	0.22	343	4.7	0.24	374	2.0
CO_2	12,900	50	74,604	2.0	60	89,525	4.7	66	98,478	2.0
H_2O	3,800	36	21,988	2.0	43	26,264	4.7	47	28,707	2.0
Particulates	4.3		24.5	2.0		29.5	4.7		32.0	

*Based on representative station pressure and temperature, 590 mm and 42.7° F.

**Difference in terrain elevation considered in calculations.

Table 2

ESTIMATED MAXIMUM 1-HOUR AVERAGE CONSTITUENT SURFACE CONCENTRATION

JIM BRIDGER GENERATING STATION*

3-Unit (1,500-mw) Operation

Three 500-Foot Stacks

WSW Sector

		Dispersion Model**								
		Coning			Inversion Breakup			Trapping		
Constituent	Constituent Emission Rate (tons/unit/day)	Concentration (ppm)	Concentration (μg/m³)	Dist. (mi.)	Concentration (ppm)	Concentration (μg/m³)	Dist. (mi.)	Concentration (ppm)	Concentration (μg/m³)	Dist. (mi.)
SO_2	94.5	.16	347	3.0	0.29	629	4.8	0.32	694	2.0
NO_x	49.7	.12	187	3.0	0.21	328	4.8	0.23	359	2.0
CO_2	12,900	32	47,747	3.0	58	86,541	4.8	64	95,494	2.0
H_2O	3,800	23	14,048	3.0	41	25,042	4.8	46	28,096	2.0
Particulates	4.3		15	3.0		28.2	4.8		31.7	2.0

*Based on representative station pressure and temperature, 590 mm and 42.7° F.
**Difference in terrain elevation considered in calculations.

Table 3

ESTIMATED MAXIMUM 1-HOUR AVERAGE CONSTITUENT SURFACE CONCENTRATION

JIM BRIDGER GENERATING STATION*

3-Unit (1,500-mw) Operation

Three 500-Foot Stacks

SE Sector

		Dispersion Model**								
	Constituent	Coning			Inversion Breakup			Trapping		
	Emission Rate	Concentration		Dist.	Concentration		Dist.	Concentration		Dist.
Constituent	(tons/unit/day)	(ppm)	(µg/m³)	(mi.)	(ppm)	(µg/m³)	(mi.)	(ppm)	(µg/m³)	(mi.)
SO_2	94.5	0.10	217	3.0	0.19	412	8.8	0.23	499	2.0
NO_x	49.7	0.07	109	3.0	0.14	218	8.8	0.17	265	2.0
CO_2	12,900	20	29,842	3.0	38	56,699	8.8	34	50,731	2.0
H_2O	3,800	14	8,551	3.0	27	16,491	8.8	33	20,156	2.0
Particulates	4.3		9	3.0		18.6	8.8		22.5	2.0

*Based on representative station pressure and temperature, 590 mm and 42.7° F.
**Difference in terrain elevation considered in calculations.

Table 4

ESTIMATED MAXIMUM 1-HOUR AVERAGE CONSTITUENT SURFACE CONCENTRATION

JIM BRIDGER GENERATING STATION*

3-Unit (1,500-mw) Operation

Three 500-Foot Stacks

NNW Sector

		Dispersion Model**								
		Coning			Inversion Breakup			Trapping		
	Constituent Emission Rate	Concentration		Dist.	Concentration		Dist.	Concentration		Dist.
Constituent	(tons/unit/day)	(ppm)	(µg/m³)	(mi.)	(ppm)	(µg.m³)	(mi.)	(ppm)	(µg/m³)	(mi.)
SO_2	94.5	0.14	304	5.0	0.21	456	7.9	0.24	521	2.0
NO_x	49.7	0.10	156	5.0	.15	234	7.9	.18	281	2.0
CO_2	12,900	28	41,778	5.0	42	62,668	7.9	48	71,620	2.0
H_2O	3,800	20	12,216	5.0	30	18,324	7.9	34	20,767	2.0
Particulates	4.3		14	5.0		20.7	7.9		23.5	2.0

*Based on representative station pressure and temperature, 590 mm and 42.7° F.
**Difference in terrain elevation considered in calculations.

Ground Level Concentrations
for
Sulfur Dioxide, Particulates and Nitrogen Oxides

From the Owners' Consultant

Appendix B

AIR QUALITY CONSIDERATIONS OF JIM BRIDGER POWER PLANT NEAR ROCK SPRINGS, WYOMING

W.L. Faith
Consulting chemical engineer, San Marino, California

SUMMARY

Three stacks, each 500 feet high, are recommended for the 3 generating units of the Jim Bridger power plant. With the use of electrostatic precipitators of 99.33 per cent efficiency to control visibility of the plumes, the 500-foot stacks will effect sufficient atmospheric dispersion of the plumes to result in ground-level concentrations of particulate matter, sulfur dioxide, and nitrogen oxides well within Wyoming and EPA ambient air quality standards.

Atmospheric dispersion was determined by use of an atmospheric model based on Briggs plume-rise equations and Gaussian dispersion, as calculated by the CONCAP Computer Program of the NUS Corporation. Meteorological input data were taken from the report of site meteorology by Western Scientific Services, Inc.

Calculations were based on the use of coal of maximum ash and maximum sulfur content. Use of coals of minimum ash and minimum sulfur contents would reduce calculated ground-level concentrations of particulate matter and sulfur dioxide by 35 percent and 53 percent respectively.

September 15, 1971

AIR QUALITY CONSIDERATIONS OF JIM BRIDGER POWER PLANT NEAR ROCK SPRINGS, WYOMING

The Jim Bridger Power Plant of the Pacific Power and Light Company and the Idaho Power Company will be located in Sweetwater County,Wyoming about 30 miles northeast of Rock Springs and 5 miles north of Point of Rocks. The plant will consist of three 500 megawatt units to be fired with coal from local mines. The coal contains 0.36 to 0.77 percent sulfur and 7.3 to 11.3 percent ash. General design data are listed in the Appendix. (see Table 1)

Air Pollution Control

The emissions from the boiler stacks that are significant from an air pollution standpoint are fly ash, sulfur dioxide, and oxides of nitrogen. Highly efficient (99.33%) electrostatic precipitators will reduce fly ash emissions to insignificant, almost unnoticeable amounts.

Stacks will be built sufficiently high to take advantage of the dispersion quality of the atmosphere so as to reduce ground-level concentrations of sulfur dioxide and nitrogen oxides to acceptable levels, as specified by Wyoming and Federal air quality standards. Considerable research and pilot plant studies of methods to reduce the sulfur content of coal or removing sulfur dioxide from flue gases are being carried out by private and public organizations, but no commercially proved method of sulfur removal is yet available. Consequently, dispersion by high stacks is the only suitable method for restriction of atmospheric concentrations of sulfur dioxide. Fortunately the coal to be used is quite low in sulfur content.

Nitrogen oxides, chiefly nitric oxide (NO), is formed during combustion by oxidation of some of the nitrogen in the oombustion air. No methods are known of effectively reducing NO formation in coal-fired plants, or of removing it from flue gases. So dispersion from high stacks is again the only suitable method of control.

An important consideration in deciding how high the stacks should be is the particular site at which the plant is located. Factors such as topography, meteorology, population distribution, and nature of vegetation are all important.

Plant Site Characteristics

The plant will be located at 6700 feet elevation in a narrow shallow valley,Dead Mans Wash, which drains in a general north to south direction. The terrain rises gently to the West for a distance of 3 to 4 miles where it reaches an elevation of 7200 feet msl. To

the north, there is similar terrain. To the south the terrain slopes gently downward. An abrupt hill about 200 feet above the valley floor lies just east of the site (1.5 miles) parallel to the valley.

The general area surrounding the plant is sparsely settled and aside from the coal mines is used primarily for cattle grazing. The vegetation consists primarily of native grasses. There is very little agriculture in the vicinity.

Site Meteorology

A meteorological study of the vicinity was initiated in early 1970 by Western Scientific Services, Inc. Fort Collins, Colorado, assisted by Loren W. Crow, certified consulting meteorologist. The findings of the first year's study is summarized in the following:

Airflow at the site is governed both by synoptic (broad-scale) flow and by local topography.

During daytime hours, the surface wind direction and velocity is usually controlled by the synoptic wind. The same situation may also occur at night when the large scale weather pattern is sufficiently strong.

Non-synoptic flow regimes are most common at night (8pm to 8am) when a cool stable layer develops near the earth's surface. The depth of the stable layer seldom exceeds 600 feet. The maximum observed depth was 1600 feet.

Atmospheric stability. To describe atmospheric stability at the Jim Bridger plant site, Pasquill stability classes are used as follows:

Class A - extremely unstable
B - moderately unstable
C - slightly unstable
D - neutral
E - slightly stable
F - moderately stable

At Jim Bridger, Classes A, B, and F are very rare. The low percentage of occurrences of A and B are related to the low percentage of high surface temperatures. Accordingly in describing weather regimes at Jim Bridger all unstable regimes are classified as C, although some A and B periods are included. The C stability class is almost exclusively limited to daytime hours. Frequency of occurrence is highest in the summer months.

The most common stability regime at Jim Bridger is Class D (neutral), and occurs both day and night.

The absence of a narrow deep valley and the location near the

Continental Divide prevents long periods of deep air stagnation at the plant site. Accordingly Class F stability is so rare it is combined with E for analytical purposes. Nearly all Class E hours occur during the night, but can continue during the day when there is a low cloud cover and little diurnal temperature change.

The percentage of hours each of the three stability classes (C, D, E) are experienced annually are: C - 12%; D - 51%; E - 37%.

Wind speed. True calm wind conditions at Jim Bridger are quite rare. Light and variable winds are virtually non-existent in the C and D categories, but represent 10 percent of the hours in Category E. During E stability periods, winds range to 10 mph with a predominant focus about 4 mph. When the stable layer is 800-foot deep, the wind increases by 3 mph at the 800-foot level. The wind velocity range for Class C stability was 5 to 16 mph, with the median at 8 to 10 mph.

Stability Class D contains all the stronger winds and many of the lighter ones. Estimation of the percentage of various velocity winds in Class D are shown below:

Percentages of Stability Class D in Wind Velocity Ranges

0-4 mph	5-9	10-14	15-19	≥ 20
3%	44%	30%	15%	8%

Wind direction. During the warmer months of the year the dominant direction of flow for neutral stability (Class D) is from the Southwest.

Under Class C, the winter months are nearly equally distributed between westerly and southwesterly. There is no dominant direction under Class C during the summer months.

For Class E, the greatest single direction is southwest. There are also southeast and northwest winds.

In all cases, the west wind is the dominant air-flow pattern at 800 feet and above, except when intense storm centers move west to east across Colorado. During such periods northeast winds (60 to 70 degrees) persist for 18 to 30 hours.

Persistency of Meteorolgical Regimes. Many days during the year show surface winds exceeding 20 mph persisting for 8 to 10 hours from the west or southwest. Four periods in which 20+ mph winds were persistent in one direction for 24 hours or more were encountered. These were:

Southwest - 24 hrs. Average velocity - 28 mph Max. - 36 mph

West - 25 hrs. Average velocity - 22 mph Max. - 22 mph

North - 37 hrs. Average velocity - 23 mph Max. - 26 mph

East-Northeast-27 hrs. Average velocity - 21 mph Max. - 22 mph

Variation of Stability with Height. The relationship between stability and height above the ground is shown in the following table. The very few stable regimes above 300 ft. is pronounced.

Relative Changes in Percentage Hours by Stability Classes with Increasing Height.

	C	D	E
Surface	12%	48%	40%
300 ft.	12	57	31
800 ft.	13	81	6
1300 ft.	13	84	3

Effect of Hill East of Site. Constant volume pilot balloon observations made during four field studies at the site showed that as the balloons approached the hillside east of the plant, they were lifted aerodynamically to an extent equivalent to the height of the hills. Consequently, no correction is needed to the effective stack height in sectors with hills.

Fumigation. An analysis by Mr. Crow indicated that fumigation will not be a major factor in glc readings. Fumigations for two hours will be very rare.

He identified two conditions where fumigation might occur. A high short-time concentration may be experienced by a downdraft caused by a convective cell in summer. Such a cell typically may be 250 feet deep, 400 feet across, and 1000 feet long. Horizontal speed will probably be 10 to 20 knots, so it will last only a few minutes.

Another possibility is when the plume is trapped in a stable layer at the effective stack height of the plume. When the stable layer changes from stable to unstable, downward mixing of the plume would cause momentary high concentrations. However, the low wind speeds generally accompanying stable conditions allow plumes to penetrate the inversion except under rare and unusual conditions.

DETERMINATION OF NECESSARY STACK HEIGHTS

To determine the necessary stack height to disperse the constituents of the combustion gases leaving the plant, the maximum ground-level concentrations (glc) were calculated for several heights of stacks, using the CONCAP atmospheric dispersion model described in the Appendix. The lowest stack height considered was 500 feet inasmuch as the boilers are 250 feet high, and good practice requires a stack twice as high to prevent downwash.

Actual computer outputs using the CONCAP model were shown in relative concentration (X/Q) values, expressed in sec/m^3. To obtain the glc in ug/m^3, one need only multiply X/Q by the emission rate in ug/sec. Inasmuch as the calculated X/Q values were expressed in 10-minute concentrations, hourly concentrations were obtained by further multiplication by the factor, 0.74. For the 3-hour concentration, the 10-minute concentration is multiplied by 0.62, or alternatively, the hourly value may be multiplied by 0.83 to yield the 3-hour concentration.

Inasmuch as most of the ambient air quality standards that must be met at the Jim Bridger plant are stated in terms of maximum 24-hour values or as annual means, it is necessary to take into consideration 24-hour and annual meteorological conditions at the site to determine glc's that will actually be experienced.

Calculation of maximum 24-hour values. The maximum 24-hour value of particulate matter or SO_2 that will be experienced will come about only when the wind blows continuously in one direction for 24 hours. All continual 24-hour uni-directional winds found in the meteorological survey averaged 22 to 28 mph in velocity (10 to 12.5 m/sec). Winds of this velocity are experienced only during Class D atmospheric conditions, so the maximum 24-hour glc would be for Class D and 12.5 m/sec winds. From Tables 3 and 4 the glc values will be $38 ug/m^3$ SO_2 and $1.6 ug/m^3$ particulate matter, insignificant values compared to the allowable $260\ ug/m^3$ and $200\ ug/m^3$. Even if Class C conditions are assumed for 50% of the time, the expected values would be only $103\ ug/m^3$ SO_2 and $4\ ug/m^3$ particulate matter,

Calculation of annual mean values. Examination of the meteorological study shows that the highest annual concentrations will result when the 800-ft. wind is westerly. Annual hourly distribution of the westerly winds are:

Class C - 356 hours at av. wind speed of 14 mph
Class D - 4274 hours at av. wind speed of 16 mph
Class E - 180 hours at av. wind speed of 3 mph

In the actual calculations, average wind speeds were not used, but winds were divided into 5 speed classes as shown in the tables. An annual maximum X/Q value was calculated for the sector affected by westerly wind. (see Table 7)

Using this sector:

$$\text{Annual max. } SO_2 \text{ conc.} = 1.33 \times 10^{-8} \times 988 \times 10^{6} = 13\ ug/m^3$$

$$\text{Annual max. p.m. conc.} = 1.33 \times 10^{-8} \times 41 \times 10^{6} = 0.5 ug/m^3$$

$$\text{Annual max. } NO_x \text{ conc.} = 1.33 \times 10^{-8} \times 492 \times 10^{6} = 6.6 ug/m^3 \text{ (calc. as } NO_2)$$

Thus, annual concentrations of SO_2, particulate matter, and NO_x are far below allowable air quality standards, and, in fact, are barely measureable.

Calculation of short-time concentrations. As shown in a later paragraph, the ambient air quality standards adopted by Wyoming and the EPA call for a 3-hour SO_2 standard of $1300\ ug/m^3$ (EPA), and for a one-hour NO_2 standard of 0.15 ppm (Wyoming).

The maximum hourly value for SO_2 shown in Table 5 is $221\ ug/m^3$ (Class C, 8-mile wind). The corresponding 3-hour value is $183\ ug/m^3$. The maximum hourly value for NO_x (calc. as NO_2) is $96\ ug/m^3$, which is 0.05 ppm.

It is conceivable, however, that Class B stability may occasionally prevail for 1-hour and 3-hour periods. Maximum X/Q value for Class B stability (see Table 2) is 6.38×10^{-7} at 5 meters/sec (ca 14 mph). Under these conditions, the NO_x hourly glc will be $6.38\times10^{-7}\times492\times10^{6}\times0.74=$ 232 ug/m³ = 0.12 ppm NO_x (hourly basis) (calculated as NO_2), a value less than the Wyoming standard.

The 3-hour SO_2 glc under Class B stability is:

$6.38\times10^{-7}\times988\times10^{6}\times0.62$ = 390 ug/m³, well below the 1300 ug/m³ EPA standard for 3 hours.

RECAPITULATION

The calculated maximum ambient air quality concentrations of particulate matter, sulfur dioxide, and nitrogen oxides (calc. as NO_2) that will result from the operation of three 500-mw units at the Jim Bridger station with 3 stacks at 500 feet each are compared with State and Federal standards in the following tables:

AMBIENT AIR QUALITY STANDARDS

Jim Bridger Plant		Averaging Time	Wyoming		United States Primary		United States Secondary	
ug/m³	ppm		ug/m³	ppm	ug/m³	ppm	ug/m³	ppm
Particulate Matter (with coal of maximum ash content)								
4	--	24-hr.	200*	--	260	--	150	--
<1	--	Annual	75	--	75	--	60	--
Sulfur Oxides, SO_2 (with coal of maximum sulfur content)								
390	--	3-hrs.	None	--	None	--	1300	0.5
103	--	24-hrs.	260	0.10	365	0.14	260	0.1
13	--	Annual	60	0.02	80	0.03	60	0.02
Oxides of Nitrogen (Wyo), NO_2 (U.S.)								
--	0.12	1-Hr.	--	0.15	None	--	None	--
5.7	--	Annual	None	--	100	0.05	100	0.05

*1% of the days in a year.

All of the above values are probably overestimates. The particulate matter and SO_2 values are based on coal of maximum ash and sulfur content, about 25 percent above the averages. The NO_x values are calculated as NO_2, whereas emissions are at least 90 percent NO, and ground level nitrogen oxides will probably never be more than 30 percent NO_2, if that.

RECOMMENDATION

On the basis of the above I recommend that the stacks at the Jim Bridger generating station be 500 feet high. This is twice the height of the boilers. With an effluent velocity in excess of 70 ft. per second, downwash in high winds will be forestalled. Ground-level concentration of particulate matter, sulfur dioxide, and nitrogen oxides will be well below Wyoming and EPA ambient air quality standards.

W L Faith

San Marino Calif
Sept 15, 1971

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